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## ORIGINAL ARTICLES.

### THE OPERATIVE TREATMENT OF SOME DISEASES AND INJURIES OF THE NERVES.<sup>1</sup>

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WHEN so much is written on modern operative procedures it is well not to overlook conditions that in many instances are at least quite as important for the welfare of the patient as some of those that, in the past few years, have excited much discussion. I shall briefly report some cases of certain diseases and injuries of the nerves that I have operated upon, with a few remarks on the operative treatment. This class of affections is common enough to interest both the physician and the surgeon, and is of sufficient practical value to warrant me in presenting a few thoughts for discussion.

The most important of the diseases of the nerves for the relief of which operative treatment may be resorted to are:

1. Painful affections, including neuralgia, neuritis, and neuromata.
2. Local spasmodic affections, including such diseases as spasmodic torticollis, facial tic, tetany and athetosis.
3. Chronic contractures, including those the result of old traumatism and those due to hysteria.
4. Scleroses.

#### PAINFUL AFFECTIONS OF NERVES.

*Neuralgia.*—In studying neuralgia from a surgical as well as from a medical standpoint, it is important not to lose sight of its predisposing and exciting causes. Cases traceable to known exciting causes, such as injury of a nerve, or pressure upon or irritation of nerve trunks, and such peripheral irritation as is present when the end of a nerve becomes involved in a cicatrix, offer the best outlook for operative interference. The so-called epileptiform neuralgia, which almost invariably attacks the face and involves any one or all of the three branches of the fifth nerve, is also favorable for operative treatment. This form of neuralgia consists of two main varieties, one in which the pain is

accompanied by twitching of the facial muscles, and a second in which pain is the only pronounced symptom. In this form of neuralgia the pain is paroxysmal, and may be occasioned by an attempt to swallow liquid, by a breath of cold air, etc. The three cases of excision of the superior maxillary nerve included in my list were of this variety. In one of these the slightest irritation of the lip, the nose, or the lower eyelid of the affected side would bring on a severe paroxysm of pain. Many cases formerly recognized as neuralgia are now generally believed to be neuritis, but a disease generally known as neuralgia remains. How does operation do good in neuralgia? It is probable that in this affection, as in locomotor ataxia, the pains may sometimes be due to molecular disturbance or impaired nutrition of the nerves themselves, or of the posterior root zones or posterior horns of the cord. Operation probably changes the molecular arrangement of the nerves and nerve-centers and stimulates nutrition.

*Neuritis.*—In neuritis, according to the stage, we have a more or less high or low grade of inflammatory process. In the chronic stage of many cases the inflammation has practically subsided, and left an exudate and adhesions, the nerve having secondarily degenerated. Operation is useful in two or three ways, either by allowing the nerve a better chance to repair, by opening the sheath and breaking up any adhesions that may be present; or, when degenerated, by disturbing the molecular condition of the nerve and stimulating it to take on regenerative action; or again, in those cases of chronic inflammation of a nerve in which physiological movements never allow it to be sufficiently long at rest to accomplish a cure, by removing a section of the inflamed nerve, and thus getting rid of the constant irritation.

*Neuromata.*—Neuromata are tumors occurring in connection with a nerve-trunk. They consist of two main classes, the true and the false. A true neuroma is composed entirely of nerve-filaments. This variety is very rare, some authorities even doubting its existence. False neuromata situated on or in a nerve are fibrous or fibro-cellular growths; a few also contain cysts. They are movable, but only transversely. They may occur in the continuity of a nerve, but particularly at its cut extremity, as seen in stumps. They are usually not painful, except when exposed to pressure, or so situated that ordinary physiological acts cause irritation. They are some-

<sup>1</sup>Read before the Lancaster County Medical Society, July 1, 1891.

times met with in large numbers. When found in the continuity of a nerve, they call for removal, which should be done with as great care as possible so as to avoid dividing the nerve. Should division of the nerve be required for the complete removal of the growth, the ends should be immediately approximated by suture. When met with in stumps, removal, if feasible, is also to be practised, and when not feasible re-amputation offers the only alternative. Nerve-stretching is advised in some cases prior to complete removal; in my hands this procedure has not proved successful. There is a variety of neuromata known as plexiform. Of this class I have met with one case, the report of which is included in my list of cases. Bowlby describes these tumors as being made up partly of soft connective tissue and fat, imbedded in which are medullated nerve-fibers and white fibrous tissue. A microscopical study of the case that I removed showed it to be made up of connective, adipose and white fibrous tissue and medullary nerve-fiber—corresponding, therefore, with Bowlby's description. The growth was very slow in forming, having been present a number of years before it came under observation. It is now five years since it was removed, and recurrence has not taken place.

#### LOCAL SPASMODIC AFFECTIONS OF NERVES.

*Torticollis.*—I have had several cases of operation on the spinal accessory nerve, and I believe that some of the reasons for the frequent failure in these operations are, first, because the movements involved in the spasm are the resultant of the action of various muscles which have diverse nerve-supplies; secondly, because the spasm is sometimes due to irritation reflected from sensory nerve-areas to the motor nerve—as, for instance, from the major or minor occipital to the spinal accessory; thirdly, in a few cases at least, because the spasm is due to a lesion of cortical or other encephalic centers.

*Facial Tic.*—In cases of facial tic, or so-called histrionic spasm, in which the muscles supplied by the facial nerve are affected, the operation of nerve-stretching has been performed a great many times, but most of the cases have been failures or only temporarily successful, for the simple reason that the vast majority of cases are due either to degenerative lesion of the facial nucleus or to cerebral irritation or degeneration.

*Tetany.*—In cases of tetany, nerve-stretching may for a time arrest the tremor and twitchings associated with the spastic contractions, but the operation is not usually to be advised.

*Athetosis.*—Nerve-stretching in the treatment of athetosis has not been of much avail, causing only temporary cessation of the clonic spasms and a paretic condition of the affected part. When

the paresis passes off, the tremor and spasm return. Evidently the majority of such cases cannot be permanent successes, since the source of the spasm or tremor is a persisting central lesion, usually situated in the cortex or near the thalamus in the interior of the brain.

#### CHRONIC CONTRACTURES OF NERVES.

In cases of chronic contracture of nerves the result of old traumatism, benefit from the operation is dependent upon the relief of the chronic neuritis and the loosening of the attachments present. In hysterical contractures operation may afford relief, but these cases are quite as amenable to treatment much less radical in character. In these cases, if the operation of nerve-stretching does good at all, it is by acting on the spinal centers, or by mental impression.

#### SCLEROSES.

The usual temporary effect of nerve-stretching in the treatment of lateral sclerosis is that the spastic condition of the muscles is partially overcome, the tingling in the extremities disappears, locomotion is improved and the reflexes are not changed. The benefit is not permanent either in this affection or in posterior sclerosis. Failures have sometimes followed this operation, owing to incomplete measures having been adopted, the nerve having merely been exposed and returned to its original position.

Nerve-stretching, as an operative procedure, has had rather a limited range of application. The benefit resulting from its performance has been thoroughly discussed without any definite conclusion as to the manner in which the result is obtained having been arrived at.

Pathological researches have been conflicting and of no practical value, hence the neurologist and surgeon are justified in acquiring actual experience by means of clinical experimentation in other affections than those which have in the past been recognized as fit subjects.

#### NERVE-INJURIES.

The most common form of nerve-injury for which the surgeon is called upon to operate is division. The complication formerly feared, and which, therefore, deterred surgeons from approximating the cut ends of the nerve by suture, was tetanus. Since the days of antiseptic surgery this complication is no longer feared. It is now a proved and acknowledged fact that the origin of tetanus is microbic, hence the use of antiseptics prevents infection and lessens very materially the chances of this complication arising. There is no doubt that the ends of a divided nerve, if left to themselves, sometimes unite. But this does not offer

an argument against suture, and I therefore take it for granted that every surgeon would unhesitatingly use the suture. The operations for the suture of divided nerves are primary and secondary. Primary suture is stitching together the ends of a divided nerve immediately after the injury or within a short time afterward and before healing of the wound has commenced. Some surgeons believe that when the section is clean, with but little separation and not complicated by an extensive wound of the neighboring soft parts, suturing should not be practised; but with these I cannot agree, for if it is a justifiable procedure under reverse conditions, it is all the more indicated when it is most likely to be followed by success. One or more sutures, depending upon the size of the divided nerve or nerves, are to be passed through the trunk, neurilemma and tubules inclusive, a short distance from either end, and drawn tight, making apposition perfect. The suturing completed and the wound closed, the limb is to be placed and fixed in a position favoring relaxation of the injured nerve. I prefer the aseptic silk suture, believing this in the long run to be most reliable. What disposition is to be made of either end or both ends if found to be much lacerated and contused? The answer to this is that if the contused and lacerated nerve-tissue is believed to be devitalized, it should be removed before the suture or sutures are introduced.

Both the proximal and the distal ends are then to be stretched, when, if apposition cannot be effected without too great resulting flexion, recourse may be had to one of the following means: *a.* Split the cut end of the nerve in such a way that by drawing down the section from the proximal end it can be united to the section turned up from the distal end. *b.* Unite the distal end of the divided nerve to a neighboring nerve. *c.* Implant a section of nerve taken from an amputated limb or from a lower animal. *d.* It has been suggested to connect the divided ends of the nerve with strands of catgut; also to introduce a decalcified bone tube between the ends of the nerve, on the supposition that nerve-tissue will be prolonged along the strands of gut or into the caliber of the tube. This latter means furnishes a framework on which the granulations can spread.

Should primary suture fail to bring about complete restoration of the part, another operation consists either in freeing the nerve, if confined by scar-tissue, or of secondary suture. Secondary suture, of which I report one case, is not by any means so simple a procedure as primary suture. The first difficulty is in finding the distal end of the nerve. This is best accomplished by making a careful dissection, the limb having been rendered bloodless. If there be trouble in finding the distal end, the

nerve below the section should be exposed, as suggested by Bowlby, when it can be traced to the scar. The ends of the nerve having been exposed, the next step in the operation consists in making a section of them. The proximal end, if found to be bulbous, is to be divided near the junction of the bulb with the trunk; the distal end, if found bulbous, is to be treated in the same manner as in the case I report. If the distal end is found not to be bulbous, but atrophied, the usual condition met with, a very small section is removed. The next step is to determine whether or not the ends can be brought into apposition. If not, they are to be treated in the manner spoken of under the head of primary suture. The length of time required for restoration after primary suture is usually short, but after secondary suture it is problematical and often quite long.

REPORT OF CASES.—To illustrate my remarks, I have selected sixteen cases from those upon which I have operated. Of this number there were six of trifacial neuralgia, in three of which I removed the entire superior maxillary branch, in one the entire inferior dental branch, and in two a portion of the inferior dental branch; one of stretching the posterior tibial for obstinate plantar neuritis; two of stretching the sciatic for neuralgia; one, for neuritis, of excision of a portion of the long saphenous, immediately after its exit from Hunter's canal; one of excision of the greater portion of the supra-trochlear, also for neuritis; one of ligation of the spinal accessory upon two consecutive occasions for spasmodic torticollis; one of freeing the musculo-spiral from encroaching callus; one of stretching the median for tetany; one of removal of a plexiform neuroma; and one of secondary suture of the external popliteal (peroneal).

CASE I. *Complete Removal of the Superior Maxillary Branch of the Trifacial.*—Mrs. S., aged forty-eight, was a patient of Dr. H. C. Clark, of Woodbury, N. J. The history of the case is, in short, that she had for seventeen years suffered with trifacial neuralgia, during all of which time, to obtain any relief, she was required to take morphia, and latterly in very large and repeated doses. She had been given the benefit of all doubt in the way of internal and local treatment, both by Dr. Clark himself and by noted neurologists throughout the country. More than two years ago I removed the nerve in question, doing Carnochan's operation, which I prefer. Complete and permanent relief followed the operation. At present writing, June 23, 1891, there has been no recurrence.

CASE II.—The patient was referred to me by Dr. C. K. Mills. He was a man aged seventy-five years, a letter-carrier, and therefore exposed to all kinds of weather. Several years before he came under Dr. Mills's care he began to suffer with severe pain in the side of the face beneath and above the eye, and



sometimes in front of the ear. The history of the case was the usual one of a gradually augmenting trigeminal neuralgia. Many remedies were used by various physicians. He had also been operated on twice by two different surgeons. At the time the patient was placed under my care the attacks were practically continuous. I removed the superior maxillary branch of the fifth nerve, giving the patient permanent relief.

CASE III.—The history of this patient—Mrs. M., aged fifty-four years, a patient of Dr. H. A. Smith, of Philadelphia—is almost parallel with that of Case I. The neuralgia was of seventeen years' standing. Removal of the superior maxillary nerve was followed by relief.

CASE IV. *Removal of the Inferior Dental Branch of the Trifacial.*—T. M., aged fifty-four years, a farmer, suffering from neuralgia of the right inferior dental nerve, was admitted into the surgical wards of the German Hospital December 16, 1889. The history of the case showed it to be one of long standing, and one in which an unsuccessful operation had been done one year before coming under my care. I removed the entire inferior dental nerve. The portion occupying the canal was exposed and taken out by chiselling away the outer wall. Immediate relief followed the operation, and at the present time the patient, through his sister, informs me that he is perfectly well.

CASE V.—J. H., aged thirty-seven years, house-keeper, was admitted into the surgical wards of St. Mary's Hospital February 13, 1891, with a history of severe neuralgia located in the region of the inferior maxilla. The pain, which was paroxysmal, extended from the ramus of the left inferior maxilla to the chin. These seizures lasted from two to three hours, and occurred three or four times daily. Hot or cold liquids, or solid food, taken into the mouth brought on severe paroxysms. The teeth on the affected side had been removed, without relief. A portion of the inferior maxillary nerve had been excised, with temporary relief; the trouble returned, and her suffering was almost unbearable. A second operation was performed, which consisted in trephining the ramus of the lower jaw at the point of entrance of the inferior dental nerve. The opening was enlarged upward, and the nerve traced to its origin from the inferior maxillary. The outer wall of the dental canal was then chiselled away as far as the site of the old operation, where the nerve was found fixed by fibrous and connective tissue containing nerve-fibers. The exposed nerve was then removed.

CASE VI.—A. M., aged thirty-three years, a housewife, was admitted into the wards of the German Hospital August 1, 1890, suffering from pain, paroxysmal in character, referred along the course of the inferior dental nerve. She had suffered for a long time, and had received a thorough course of treatment without affording relief. A portion of the nerve was removed, with complete relief from pain.

CASE VII. *Excision of the Long Saphenous Nerve.*—C. K., aged fifty years, a tinsmith, was admitted to the surgical ward of the German Hospital, December 9, 1890, suffering from unmistakable chronic neuritis

of the long saphenous nerve supplying the inner side of the knee and leg. The nerve was exposed immediately after its exit from Hunter's canal, and a section of two inches removed. The recovery was perfect.

In circumscribed plantar neuritis, when the pain is confined to the third metatarso-phalangeal articulation, or more particularly to the fourth, the ingenious operation of Dr. Thomas G. Morton, of Philadelphia, that of excision of the articulation, often serves to accomplish a cure. In cases of this character, however, I cannot but think that excision of the affected plantar nerve or nerves would accomplish all that is accomplished by the removal of the joint. This excision of the nerve or nerves must be done radically, taking them out as far back as possible, and not being satisfied with removing a section, say of only one inch in length, which would afford but temporary relief.

The rationale of the operation as suggested by Mr. Collier is, that as the disease consists essentially of an excessive intermittent and irregular discharge of energy along the spinal accessory nerve, the introduction of increased resistance in the course of the nerve and the possible deflection of some of this energy into other structures than the sternomastoid and trapezius muscles might result in an abatement or cure of the trouble. Mr. Collier has reported one successful case. Temporary improvement followed the operation in the case I report, but I am sorry to say it was but temporary, as in a short time the spasms returned with their former severity. Thinking perhaps the technique of my operation was faulty, I repeated it, but with a negative result. Of the different operations performed for the relief of this condition, namely, stretching, excision, and ligation of the spinal accessory nerve, also myotomy of the muscles at fault, and also the operation devised by Dr. W. W. Keen—division of the cervical nerves supplying the posterior cervical rotators—that of ligation strikes me as the most philosophical. It is questionable, however, if spasmodic torticollis can be permanently cured by operative treatment alone, unless the centers governing the movements of the muscles affected can be definitely located and successfully removed. Even were this result attainable, recurrence of the spasms would be as likely to follow as in other cases of focal (Jacksonian) epilepsy, after the removal of a portion of the cortex.

CASE VIII. *Excision of the Supra-trochlear Nerve.*—The patient, a lady, was seen by me in consultation with Dr. O. P. Rex, of Philadelphia. She was suffering from obstinate facial neuralgia, limited to the distribution of the supra-trochlear. The ordinary line of treatment failing to afford relief, the nerve



in question was removed. There was complete recovery.

CASE IX. *Plexiform Neuroma*. — W. H. P., twenty-nine years old, a hatter, was referred to me by Dr. Jno. Strobel, of Philadelphia, giving the following history: For eleven years he had had over the olecranon process a growth which had become of the size of a large English walnut; the overlying skin was dark-bluish in color. The patient had for six years worn an appliance to prevent movement of the elbow, and to protect the growth from the clothing, it being so sensitive that the slightest irritation would suffice to excite unbearable pain. So great, indeed, was the pain caused by the slightest interference with the growth, that the patient would not permit me at the first visit to examine it. I believed it to be a neuroma and advised its removal. The operation was performed in December, 1889. Recovery was prompt and satisfactory.

CASE X. *Removal of Callus Encroaching upon the Musculo-spiral Nerve*. — The patient was a man, thirty-five years old, who had sustained a fracture of the upper portion of the shaft of the right humerus, the healing of which resulted in exuberant callus, involving the musculo-spiral nerve. When he came under my notice there were present all the symptoms of neuritis of the radial and posterior interosseous nerves, the terminal branches of the musculo-spiral. Recognizing the cause of the condition, I advised removal of the offending callus. The operation was done, and followed by cure.

CASE XI. *Stretching of the Posterior Tibial for Neuritis*. — A. K., aged thirty-eight years, a seamstress, was three years ago admitted to the Philadelphia Hospital, in the service of Dr. C. K. Mills. She had been a drinking woman, and for several years had been subject to epileptic seizures. For ten months she had suffered from pain in the left foot, chiefly in the heel and along the outer border of the foot. The pain was accompanied by a "pins-and-needles" sensation. It was dull and aching in character. A few weeks before the commencement of the trouble in the left foot, a similar, but more severe, pain was felt in the right foot, chiefly in the heel and along the outer border. Not receiving any relief from well-directed remedies used both internally and locally, Dr. Mills asked me to stretch the right posterior tibial nerve, which I did on June 11, 1887. The nerve was exposed between the internal malleolus and the tuberosity of the os calcis. The patient was kept in bed for six weeks after the operation; recovery followed.

CASE XII. *Stretching of the Median Nerve for Tetany*. — The patient, a man, twenty-eight years old, was admitted to the surgical ward of the Philadelphia Hospital, in the summer of 1888, with spasmodic contraction of the superficial flexors of the forearm (those supplied by the median nerve). Both by the neurologist on duty and myself the trouble was regarded as tetany. Therapeutic agents indicated in this condition having been tried with negative results, I stretched the median nerve. Although not resulting in absolute cure the operation was followed by marked improvement. The patient left the institution contrary to advice and I

am consequently unable to record the further history of the case.

CASE XIII. *Successful Stretching of the Sciatic Nerve*. — This patient, referred to me for operation by Dr. Mills, was an electrotypist, thirty-two years of age, without a history of syphilis, constitutional disease or abuse. About three years before he came under observation, he was in the habit of frequently riding the bicycle, particularly in the evenings. Three months after beginning this exercise, he noticed pain in the back of the left thigh. This persisted from day to day, and from week to week, gradually increasing in intensity. The pain seemed to start about half-way between the hip and the knee in the back of the thigh. From this point it would extend in both directions, so that the painful and uncomfortable sensation would reach the bottom of the foot, and in the other direction, the sacral region. At times he would have considerable numbness and tingling in the leg, particularly below the main focus of pain. He described the pain as at times being excruciating. For three years he had been treated by various physicians. Among other measures that were thoroughly tried were electricity, both faradism and galvanism, the actual cautery, and many internal remedies, such as iodide, the salicylates and antiperiodics, as arsenic, quinia, etc., also numerous anodynes. A course of massage and Swedish movements had also been tried, and he had been subjected to hypodermatic injections.

He suffered mostly with this pain in the evening, and when sitting down during the day. When moving about, the pain gradually decreased, and he was sometimes hardly aware of it, but it never absolutely left him. We found that the pain was still most severe at the original spot, about the middle of the posterior thigh; some numbness and tingling followed the posterior external aspect of the leg, downward to the foot. Lately it seemed as if the pain had increased in the upper thigh and in the gluteal region. On pressure no tenderness was present. We also made a careful examination by the rectum to ascertain the condition of the sacral plexuses, and determine whether or not a growth or other morbid condition was present in the pelvis, but nothing was discovered. As the patient had already been treated by almost every measure promising success, except nerve-stretching, this was advised, and, after having the operation explained to him, he consented to have it done. With strict antiseptic precautions, I exposed the nerve for several inches at the place of the greatest pain. No tumor could be detected. Some thickening and inflammation of the nerve-sheath was present for about an inch and one-half or two inches. After opening the sheath and loosening the thickened bands, the nerve was carefully stretched by pulling it strongly first in one direction and then in the other. In about two weeks the man was again on his feet. For several weeks he presented symptoms of traumatic neuritis in the sciatic distribution below the seat of the operation—spontaneous pain and hyperesthesia in the nerve-distribution, and pain on lateral squeezing of the foot—but the old pain was gone. After a few weeks of

treatment with mercurial and belladonna ointments, salicylates, tonics, rest and hot applications, the neuritis which had resulted from the operation disappeared. He was also free from the old pain, and has remained so to the time of making this report.

CASE XIV.—T. J., aged twenty-five, a laborer, a patient in the nervous wards of the Philadelphia Hospital; had been irregular in his habits, and was addicted to the use of alcohol—drinking, according to his own statement, “everything that came in his way.” He had never had syphilis. In February, 1890, he complained of soreness of the hip and thigh. This soreness increased over the back of the leg and thigh, and in the upper portion of the foot; he also had a tingling and a numbness in the lower part of the leg and foot. These were greatly increased by exertion or pressure. Lying in bed greatly relieved him, and, in consequence, for the sake of the comfort that he obtained he often remained in bed two or three days at a time. In walking, semi-flexion of the leg apparently relieved the intense pain. Latterly this pain had extended to the gluteal regions. He was treated for several months with the usual remedies that are employed in sciatic neuritis, including iodide, antiperiodics, salicylates and hypodermatic injections of morphine and atropine. He improved somewhat, but no decided relief was obtained. September 3, 1890, he was removed to the surgical wards of the hospital, where I exposed and stretched both sciatic nerves. At first he had some of the same neuritic discomfort that followed the other operation, but after a week he began to improve decidedly. In less than a month he was entirely free from pain in the leg and thigh.

CASE XV. *Ligation of the Spinal Accessory Nerve for Relief of Spasmodic Torticollis.*—The patient was a woman who some months before had sustained an injury to the back of the head. The resulting clonic torticollis was of a severe nature, resisting all ordinary treatment, both internal and external. Gelsemium had been tried with apparent success, but on discontinuing the drug there was an immediate return of all previous symptoms. More radical measures being evidently necessary, Dr. C. K. Mills, under whose care the patient was, suggested to me the propriety of ligating the spinal accessory nerve of the affected side with silver wire, after the manner of Mr. Mayo Collier, of London. The nerve was exposed at its exit from the sterno-mastoid muscle, and ligated as high up as possible. The loop of wire an inch in length was left at the bottom of the wound, where it subsequently became encysted. The wound healed kindly, the wire ligature occasioning no inconvenience.

CASE XVI. *Secondary Suture of the External Popliteal Nerve.*—Mr. M., when twenty years of age, at the battle of Sharpsburg, in 1862, sustained a gunshot injury of the great trochanter of the right side, followed immediately by intense pain, causing him to fall to the ground. Upon rising and attempting to put the right foot to the ground he was again attacked with pain. Ten days later, when turned over on the left side to have the wound dressed, he suffered from pain referred to the outer side of the knee. Four months from the time of

the injury, he resumed his duties in the army, being but little inconvenienced by the wound. In 1867 (five years after injury), he noticed on the outer side of the right knee a small lump, pressure upon which caused pain referred along the course of the external popliteal nerve. The swelling slowly increased in size and sensitiveness until it was about the size of a small English walnut. In April, 1890, the lump, evidently a neuroma (it was not examined microscopically), was removed by his family physician, no anesthetic being used. The removal was followed by paralysis of the extensor muscles of the foot, which indicated that the nerve had been severed in excising the growth. He consulted Dr. William Pepper, of Philadelphia, who, after a careful examination, referred him to me for my opinion as to the advisability of an operation. In view of a number of successful results obtained by secondary suture of nerves of the upper extremity, it seemed reasonable to suppose that the operation might be equally successful in the lower extremity, although no case had as yet been reported. I operated upon the patient at his home, July 1, 1890. Upon making an incision in the line of the nerve, the two ends were exposed. Both were found bulbous, which is contrary to the usual condition in such cases, the lower end being commonly frayed out and lost in the surrounding tissues. The bulbous ends were freshened by the removal of a small section, approximated by stretching and flexion of the leg upon the thigh, and held in apposition by catgut and aseptic silk sutures. The flexed position of the limb was maintained by the application of an obtuse internal angular splint worn for six weeks. At this time the splint was replaced by a plaster-of-Paris dressing. Barring an attack of traumatic neuritis the recovery was uneventful. Some months after the operation, at my suggestion he came to Philadelphia and was placed under the care of Dr. C. K. Mills for massage and electrical treatment. Examination showed a return of sensation, but not of motion. The nerve was undoubtedly united, it being distinctly felt in its normal position, and pressure at the seat of suture causing pain along its terminal branches, which before the operation had become so degenerated that sensation was abolished. The patient has recently written to me that he is slowly regaining the power of motion, which is a further proof of good union. In cases reported by Bowlby, motion has rarely returned earlier than fifteen months after operation. This is the only recorded case of secondary suture of the external popliteal nerve—at least I have been unable to find any other.

#### HEAT-STROKE (THERMIC FEVER) IN INFANTS.

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HEAT-STROKE, as an effect of atmospheric heat, has as yet no place in the treatises on pediatrics. Clinical facts that have come under my observation have convinced me that as an etiological factor summer heat deserves greater consideration than it has



hitherto received and that heat-stroke is one of the pathological states that may be produced by it.

CASE I.—On a September morning I was called to a baby, one year old, in good flesh, that nursed at the breast. The afternoon of the previous day it had been seized with vomiting and diarrhea; the family physician was called and prescribed neutral mixture, 2 ounces; laudanum, 12 drops. Of this mixture a teaspoonful was given every two hours, until the patient had taken about half. When I saw the patient, the pulse was feeble—almost imperceptible; the eyes covered with a film; the respiration gasping and shallow; the muscles of the jaw firmly contracted; the occiput and the whole body hot to the hand. The face was purplish and presented the appearance of a person in asphyxia. I directed an ice-bag to be placed on the head and flannel cloths wrung out of hot mustard-water to be applied to the feet. Two teaspoonfuls of a mixture of three parts water and one part whiskey were given with a few grains of hydrate of chloral. A few hours later the child was no better. As the child did not swallow, the medicine was not taken. The thermometer in the axilla indicated 106° F.; the skin was dry and hot, the respiration was shallow and infrequent. There was complete loss of consciousness. I had the child placed in a warm bath, the ice-bag being kept upon the head. For the time being, this seemed to do good, but after the child was out of the bath for a few moments it relapsed into its former condition. I therefore had the naked child wrapped in a sheet wrung out of cold cistern water (having a temperature of about 70°), and placed in its cradle and covered with a blanket; in seven minutes the sheet was hot and almost dry; it was removed and replaced by a fresh one. The respiration became deeper and more regular and the child presented the appearance of being in a tranquil sleep. The moment the sheet became warm, the baby grew restless and would groan, the respiration becoming gasping, to be relieved by the application of a freshly wrung-out sheet. The application of the wet pack was continued all the afternoon and night. At 11 P.M. the thermometer recorded 103° F. The sheets would now remain cool for half an hour. This procedure was continued regularly all night, the mother doing her duty attentively and intelligently. The next day, at 8 A.M., the thermometer in the axilla registered 101° F. The child still appeared unconscious. The treatment was continued. At 1 P.M. the child's temperature was 99¾°. At 4 P.M. consciousness returned. The wet pack was now discarded and the treatment continued with quinine in small doses, and strong coffee. The child was discharged well.

CASE II.—In June I was called to see baby V., ten months old, well developed and in fair flesh; it nursed at the breast. It was taken ill in the night with vomiting and diarrhea. At the time of my visit, at 10 A.M., the baby was lying in the cradle with its eyes half closed, moaning occasionally, and restless. The temperature in the axilla was 104° F. The child vomited whenever she nursed. I prescribed a mixture of spirit of Mindererus, sweet

spirit of niter, and a minute quantity of tincture of aconite, to be administered every hour. In the afternoon I was told by the mother that the child had vomited the medicine every time it was administered; the child also vomited after nursing. The temperature appeared higher. I directed the mother to omit the medicine for a few hours and not nurse it during that time; at intervals to sponge it with lukewarm water and vinegar. About 9 P.M. the temperature of the air, which had been high all day, had become intense. The temperature of the baby, despite repeated spongings, had risen to 105¾° F. There were great heat of head, great restlessness, hurried respiration, marked movement of the *alæ nasi*, and rapid pulse. I directed that the child be placed in a cold wet pack. The effect was marked; the restlessness disappeared at once, the respiration became tranquil and the child fell into a calm sleep. As soon as the pack became warm, the restlessness and hurried respiration returned, to disappear immediately upon the renewal of the pack, which was continued all night. At 9 A.M. the temperature in axilla was 101¾° F. The baby had nursed twice in the night and had retained the milk. The diarrhea had ceased. The wet cloths were continued until noon. At 1 P.M. the temperature was normal, and the pack was discontinued. There was no return of the unfavorable manifestations. The child was discharged as well the next morning.

The two cases reported are undoubtedly cases of *heat-stroke* or *thermic fever*, recognized by a consideration of the symptomatology and comparison with the phenomena obtained in experimental investigations, and by the success of the therapeutic measures adopted. In experimental studies upon the effects of high temperatures in animals, a series of phenomena, progressively manifesting themselves as the temperature of the animals rose, was observed. These may be summed up in the order of their appearance: nausea; dyspnea and cardiac irregularity, with greatly increased rapidity of pulse; and heat rigidity. In the experiments made by Krischaber<sup>1</sup> upon himself he noted as a consequence of the rapid elevation of temperature: increased rapidity of heart's action (pulse rising from 75 to 160), headache, malaise, and nausea—phenomena like those observed in the experimental studies on animals. That the first case is one of heat-stroke will hardly be questioned, the array of symptoms pointing to this conclusion. We have the initiatory phenomena, the progression in gravity, until at the time when I saw the case the climax was reached; a state of asphyxia, due to the diminished exhalation of carbon dioxide and great destruction of oxygen, an effect observed by Litten in his experimental

<sup>1</sup> Litten: "Ueber die Einwirkung erhöhter Temperaturen auf den thierischen Organismus," *Vichow's Archiv*, Band 70; Naunyn: "Fieber und Kaltwasserbehandlung," *Archiv für experiment. Patholog. u. Pharmacol.*, Band 18.



studies. In addition we note the occurrence of heat-rigidity in a limited number of muscles. The second case, although not so marked as the first, is, nevertheless, also one of heat-stroke. In this case we note the increase in the gravity of the phenomena running parallel with the exaltation of the temperature. We have the vomiting that ensued when anything was administered by the mouth or when the patient nursed; then the setting in of dyspnea, with the frequency of the respirations; the great rapidity of the heart's action, as indicated by the pulse; the great restlessness, due partly to the dyspnea and partly to the cerebral irritation, equivalent in the infant to the headache observed in the experimental study in adults. Taking both cases together, we have a striking clinical verification of the phenomena noted in the experimental studies, the second case presenting the phenomena as they gradually develop, and the first illustrating the climax.

Two symptoms recorded in the history of our cases, vomiting and diarrhea, are as yet unaccounted for, similar phenomena not being recorded in the experimental studies referred to. A moment's thought, however, will show that they have the same etiological relation as the other phenomena and that they form part of the history of heat-stroke. Nausea is a manifestation of high temperature; it is a short step from nausea to vomiting, especially in the infant that cannot speak and to whom food is tendered at varying intervals. As a result the food is immediately rejected. It is indeed so common a fact that infants vomit with any sudden and marked elevation of temperature that this point needs no further elucidation here. There is, however, further and more direct proof in the fact that in adults vomiting has been noted as one of the phenomena of heat-stroke.<sup>1</sup>

It is an established fact that with a febrile elevation of temperature the digestive power of the stomach is greatly depressed; this is especially true in the pathological state known as heat-stroke, in which even minor degrees of elevation of temperature provoke greater disturbances than the more marked elevations of fevers.<sup>2</sup> Part of the food in the infant's stomach passing undigested into the intestinal canal, there acts as an irritant, excites abnormal peristaltic movement and a diarrheal discharge results. In this connection another factor may be invoked, namely, stimulation of the vagus center. It has been experimentally demonstrated by Cyon that a sudden elevation of the temperature of the blood circulating in the brain (from 34 to 48° C.), by stimulation of the vagus center in the medulla,<sup>3</sup>

causes slowing of the heart's action (from 23 to 5 in ten seconds).

The increased frequency of respiration observed with elevations of temperature, is also confirmatory of stimulation of the vagus center. It is probable that moderate elevation of temperature will have a more decided effect upon the very mobile and impressionable nervous system of the infant than in the case of an adult. It is well known that stimulation of the vagus excites peristaltic movements in the small intestines.<sup>1</sup> Now this stimulation of the vagus, alone or superadded to the irritation produced by undigested food, excites such rapid peristalsis as to give to the evacuations their diarrheal character. Taking the foregoing facts into consideration we are justified in considering the vomiting and diarrhea mentioned in the histories of the cases related as part of the symptomatology of heat-stroke.

CASE III. In the summer of 1885, I was called one night, at about 10 P.M., to see baby K., about one year old, bottle-fed. The family lived in a long one-story building, the front and larger part of which was used as a furniture store and the remainder as the living-rooms. The building was closed in on both sides and all the ventilation and fresh air was provided for by the front doors. During the afternoon the infant had been seized with vomiting, rejecting all that was given him. Later, he became restless, and would not lie in his cradle. It was a warm night. After a hasty examination I prescribed a mixture containing hydrate of chloral. The medicine was rejected each time it was administered. The child passed a restless night. On more careful examination it was found that as the child was held on its mother's arm it inclined its head toward the head and shoulder of the mother, as if its head were heavy and difficult to support. The head was hot to the touch; the eyes were dull; the face was pale; the axillary temperature was 103°; the pulse was about 130. Taking all the phenomena into consideration I concluded that I had a case of incipient brain trouble before me. It, however, occurred to me that perhaps the heat of the room might be responsible for the illness of the child. I therefore directed that cloths wrung out of ice-water be applied to the child's head and that after a few hours' steady application of the cold cloths upon the head, it be given every half-hour a teaspoonful of a mixture of equal parts of lime-water and milk; if this were well borne, then after four or five hours the dose was to be increased to two teaspoonfuls. On the next morning I found my little patient much better. The child appeared brighter, it held its head better, it did not vomit and had rested well during the night. The temperature was 101°, the pulse was much diminished in frequency. I directed the treatment to be continued, advised a slight increase in the quantity of milk and lime-water, but

<sup>1</sup> Quain's Dictionary of Medicine, article "Sunstroke."

<sup>2</sup> Naunyn, loc. cit.

<sup>3</sup> Ibid.

<sup>1</sup> Foster's Physiology, ed. 1880, p. 380.

positively forbade feeding with the bottle. On the following morning my patient was well, but weak. The baby had slept well during the night; in the morning it had taken its bottle well and with some avidity. Its temperature was normal and it held its head up well.

At the first glance it might appear that I had incorporated into this paper a case of beginning meningitis. It needs no elaborate elucidation, however, to demonstrate clearly that this is not so, and that the case properly belongs in the category under consideration. There was no prodromal history. The child was well until the day upon which I made my first visit. There is no history of convulsions, no history of twitching. There were no ocular phenomena, nor any drowsiness. In fact most of the symptoms of meningitis were wanting. There was, however, a history of sudden invasion, of vomiting of everything administered, of elevation of temperature, of great restlessness—symptoms that, taking the season and surroundings into consideration, all point to one morbid state, namely, heat-stroke.

It is true that the attitude of the child, a manifestation of the greatest importance in infantile symptomatology, seemed to point to the head as the seat of the morbid process, but the peculiar attitude is also one of the features of heat-stroke, even in its earlier stages. Obernier states that in heat-stroke, with a temperature of but 102° or 103° F., malaise, headache and rapid pulse are present.<sup>1</sup> Furthermore, it is probable that the greater prominence of the head symptoms was due to the reflection of heat from the ceiling upon the comparatively bare head of the infant, thus producing a greater degree of cerebral irritation than if the heat had been more equably distributed and its influence exerted upon the whole body.

**ETIOLOGY.**—As may be seen from the histories of the cases reported, nothing extraordinary occurred to which heat-stroke could be directly attributed. There was no undue exposure to the sun or to excessive artificial heat. There remains, therefore, as the sole etiological factor, the atmospheric heat of the surroundings, and the season, *i. e.*, the summer.

The surroundings of the little patients were such that the heat of a not excessively hot summer would readily suffice to give rise to thermic fever in infants, who are so very susceptible to the influence of heat. Case I. lived on the second floor of a two-story frame building, located in a narrow street at the foot of a hill with a tier of streets rising above it. The first floor was utilized as a bakery. Though the two rooms on the second floor were comparatively large, there was no ventilation; the

windows of the front room opened on the narrow street, with much higher houses on the opposite side; the window of the rear room opened into a small court, with a large frame building at the further end, and beyond this there towered, one above the other, the houses on the tier of streets on the hill. The front room was divided from the rear room by a full partition-wall, communicating only by a narrow door, so that a free current of air was an impossibility. In the rear room all the cooking for the family and all the service requiring fire was done; the front room served as bedroom for father, mother, and four children. Owing to the narrowness of the street the front shutters had to be kept closed at night. To this must be superadded the location of the rooms—very near the roof (only separated from it by a small space)—and the heat created in the building by the bakery. In Case II. the family lived in a small back room of a tenement-house, with door and windows opening on a close court. This room was on the ground floor and served as a kitchen and bedroom for the mother and four children. Even on the hottest nights they were compelled to keep everything closed. That heat-stroke can occur in over-heated rooms is so well known and so well established that it needs no further proof here.<sup>1</sup>

**TREATMENT.**—After the labors of Jürgensen, Immermann, Liebermeister, and others, it would be a work of supererogation to enter into any long discussion as to the *rationale* and the propriety of hydriatric treatment of high temperature; if this be true of fever, in which the philosophy of its application is rather complicated,<sup>2</sup> it is certainly true of heat-stroke, in which the therapeutic indication is the rapid abstraction of heat. Naunyn thus clearly expresses himself on this point: "To avoid any misunderstanding upon this point I refer to it again and declare expressly and distinctly that in heat-stroke I regard the rapid cooling of the system with cold water an absolute necessity."<sup>3</sup> My manner of following out the indication for treatment has been given. The wet pack referred to was used as follows: a large muslin sheet was folded in its length and then in its breadth and wrung out of cold water; the naked child was wrapped in the sheet, placed in its bed or cradle and covered with a blanket. As soon as the sheet became warm, it was removed and replaced by another that had meanwhile been cooling in the water; this procedure was continued until the temperature reached the normal. I am so explicit on this point for the reason that my method of using the wet pack differs

<sup>1</sup> Quain's Dictionary of Medicine, article "Sunstroke."

<sup>2</sup> Liebermeister, "Antipy. Heilmethoden," Ziemssen's Handbuch der allg. Therapie, p. 15.

<sup>3</sup> Naunyn, loc. cit.

<sup>1</sup> Naunyn, loc. cit., p. 59.

from that described by Winternitz<sup>1</sup> and by Liebermeister.<sup>2</sup> The method is easy of application. All who have had any experience with children know the difficulties attendant upon putting a sick child into a bath—and more especially a cold bath—the stratagems that must be resorted to, the struggles of the child in the bath, its cries—all certainly not beneficial to the little patient. In the wet pack the child is so comfortable, that it is only when the pack becomes warm that the child cries and shows any uneasiness. I believe that the wet pack as here described is a more powerful agent for the abstraction of heat than the cold bath. It is true that the cold bath produces a marked and rapid lowering of the temperature, but this effect is not permanent and after a longer or shorter period of time the temperature has again risen, frequently to its previous height. The cold bath must then be repeated.<sup>3</sup> The question that has presented itself to me is whether the shocks to the system consequent upon the use of the cold baths<sup>4</sup> may not have some deleterious action upon the organism. The wet pack does not produce so rapid a depression of the temperature, but, on the other hand, if applied as here detailed, it is not followed by a secondary elevation; the heat is abstracted gradually but continuously, and, in the time required for this gradual abstraction, the system has accommodated itself to the changed condition. In Cases I. and II., in which the temperature was very high and at a dangerous point, and in which as large and as rapid an abstraction of heat as possible was indicated, I applied the wet pack to the whole body. In Case III., however, in which the temperature was but 103° and no immediate danger threatened, I used only the limited pack, *i. e.*, a heavy towel folded three or four times, wrung out of ice-water and applied to a limited portion of the body—in this instance to the head. I believed that the chief source of trouble lay in the great heat reflected from the ceiling upon the head of the infant, and hence it appeared to me that the therapeutic indications, *viz.*, an obviation of the cause and an abstraction of the heat already absorbed, would be accomplished by the limited wet pack upon the head. The result was all that could be desired. In the general wet pack I used only ordinary hydrant water; in the limited wet pack I resorted to ice-water, thereby greatly enhancing the refrigerant influence.

From all that has been said—from the careful study of the symptoms and a comparison of them with the phenomena produced in the experimental

studies of the effects of heat, from a study of the etiological conditions and from the results obtained by the special treatment, I believe myself justified in claiming that "heat-stroke" or "thermic fever," as resulting from over-heated apartments, must be considered in the category of the summer diseases of infants. Though I have seen but the few cases here recorded, it cannot be doubted that many more have occurred and still do occur every summer in the large cities wherein a great part of the population dwells under conditions as unfavorable as, or even more so than, those referred to in the etiological section of this paper—for it certainly is not to be supposed that mine were the only cases that occurred; but they have hitherto remained unrecognized, being engulfed in that great vortex that is made to swallow so many things, to wit, cholera infantum.

The importance of recognizing the fact that heat-stroke is of more frequent occurrence than has hitherto been believed, and that it may be produced by the heat of apartments, is not to be underestimated—more especially as, from their symptomatology, these cases are apt to deceive. Cases I. and II. present many analogies to cases of cholera infantum. It is a fact that most cases of vomiting and diarrhea occurring in infants in the summer months are set down as cholera infantum. This accounts for my uncertainty as to the therapeutic measures to be resorted to in Case I., for, though this was a typical case of heat-stroke, my mind was so occupied with the previous history of vomiting and diarrhea that I looked upon it as a case of cholera infantum *in extremis*, in which nothing would avail, and had it not been for some previous experience with the wet pack I should not have dreamed of resorting to hydrotherapy. Although a careful study of the case afterward disclosed to me its true nature, when I encountered Cases II. and III. I was still in a state of uncertainty as to their true character.

Cases like the third are apt to be mistaken for cases of cerebral disorders. In fact, in West's *Diseases of Children*<sup>5</sup> we find a case of heat-stroke from exposure to the sun treated of under the head of cerebral congestion.

The recognition of the true character of these cases is therefore of vital importance, for upon the diagnosis will depend the correct and appropriate therapeutic measures to be resorted to. If correctly diagnosed, appropriate measures (already indicated) will be instituted and crowned with success, even in desperate cases; if not, the patient may be dosed and medicated until death closes the scene.

*Mosetig-Moorhof* has been selected to assume charge of the second surgical department of the Vienna General Hospital, formerly under the care of Salzer, deceased.

<sup>1</sup> Winternitz, "Hydrotherap.," Ziemssen's Handbuch der allg. Therapie.

<sup>2</sup> Liebermeister, *loc. cit.*

<sup>3</sup> *Ibid.*

<sup>4</sup> As this is not the place to go into this in detail, I will only refer to the rigors that accompany the elevation.

<sup>5</sup> West: Lectures on Dis. of Children. Philada., 1866, p. 48.

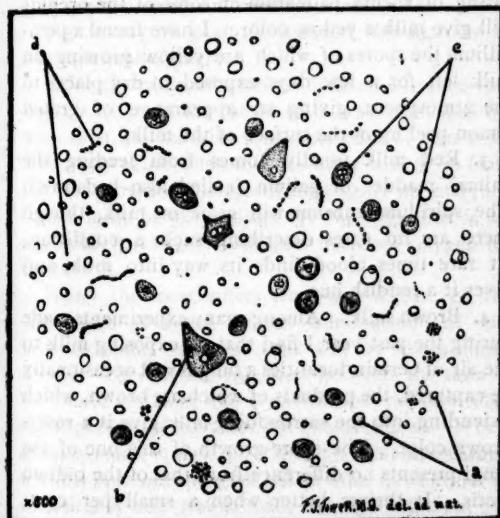


## MILK INFECTION.

BY F. J. TOWER, M.D.,  
OF MILWAUKEE.

CONSIDERING that at least 7,000,000,000 gallons of milk are consumed in the United States alone, it seems a matter of more than little importance to appreciate the source of milk infection, especially when we find milk more ready than any other aliment to absorb poisonous substances and become a culture-bed for numerous germs and an undoubted carrier for such diseases as tuberculosis, anthrax, typhoid fever, diphtheria and scarlatina. How many cases even of *tabes mesenterica* and typhoid fever are caused by infected milk it is hard to say, but certainly a large per cent. can be traced to it. The origin of a late siege by an amoebic dysentery that one of the Eastern cities has had could undoubtedly be found in the adulteration of milk with water from a source contaminated with this amoeba. Water from a stream upon which are situated distilleries, glue factories, wool-cleaning establishments, or which has sewers running into it, when drunk by cattle will infect the milk with many varieties of vegetable and animal life of a low form, and is very detrimental, not only when fed to infants and invalids, but causes diarrheas and gastric disturbances in healthy adults.

FIG. 1.



a. Milk globules. b. Epithelial cells. c. Pus-corpuscles. d. Cocci.

**Varieties of Poisonous Milk.**—1. Milk taken from a cow with garget, and allowed to stand for twenty-four hours, will on proper treatment and great care in manipulation, which is always necessary when treating for a ptomaine, furnish an alkaloidal substance of which 0.01 gram injected subcutaneously in a rabbit will produce death in about sixteen

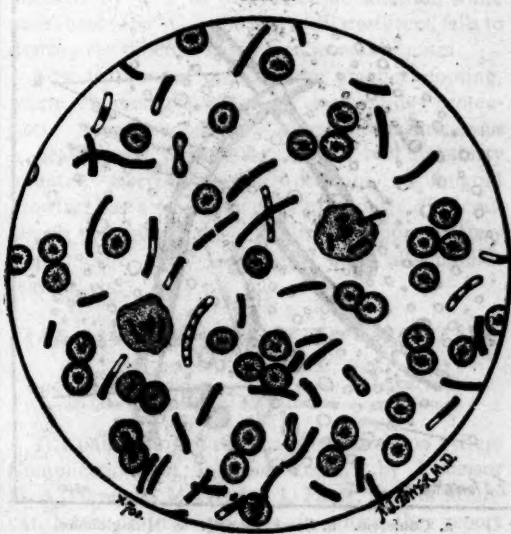
hours. In Fig. 1 is seen the microscopical appearance of such milk, showing cocci, epithelial cells, pus-corpuscles and the milk-globules.

2. When adulterated with water into which the excrements of a typhoid fever case have found a way, the milk will give the Ehrlich diazo-reaction, which depends upon the formation of an anilin-red from the amine products of the *bacillus typhosus*. The destruction by disinfectants of the organisms in the feces does not necessarily render them innocuous, for the poisonous albuminoids still remain, and, administered with the milk in which they are found, produce a typhoid condition in animals.

3. Milk from a cow suffering with anthrax, taken in the quantity of 0.3 gram, and injected at the base of the tail of a mouse, will in two days kill the animal, and the blood will be found to teem with the *bacillus anthracis*. Fig. 2 shows a fresh cover-glass preparation of blood from a mouse killed by anthrax; the white corpuscles, of which two are seen, are entered by the bacilli.

4. The milk of an animal affected with any condition of debility or febrile disorder is viscid and will coagulate almost immediately on removal; it will be found to contain ammonium carbonate in very appreciable quantities, also several organisms, and appears under the microscope to resemble colos-

FIG. 2.



trum, which it is not, for a very small quantity of the milk added to fresh milk will produce a like condition. The reaction is very alkaline; the milk has a peculiar soapy taste, and the milk-globules are irregular in shape, the emulsion being poor.

5. In milk which has stood in a damp place for twelve hours tyrotoxicon is found to such an extent

that many cases of poisoning are at present on record, and many more, in which the cause of death was only suspected, might have been traced to the presence of tyrotoxin in food containing the milk. The cases of ice-cream and cheese-poisoning are in most cases due to the same agent. The frequent and even pardonable inability of the chemist to find the exact cause often leaves us at sea for a cause for the sickness or death, as oftentimes physiological experiments, and not chemical analysis, will determine for us the presence of the alkaloid. This tyrotoxin is the product of several varieties of bacteria, as I have been unable to procure any pure culture from milk containing it. In warm weather, especially after much rain, and when the heat causes a slight vapor to arise from the ground of damp places, milk in a very few hours becomes poisonous. At such a time of the year, when infantile diarrhea is very prevalent, there is no doubt but that the milk in most cases contains the tyrotoxin.

6. Among the coloring material used by dairymen to give skimmed milk a creamy appearance is a substance which is very frequently adulterated with red-lead, and the annatto (so called) becomes a poisonous substance, and quite unfit for use. One case of this kind has been reported. Saffron is also

very much like skimmed milk. In Fig. 3 is shown a specimen of milk such as I describe.

8. In many milks there is found the *oidium lactis*, which is a penicillium, and seems to exert a very detrimental influence upon young bottle-fed children. Whether it is the actual presence of the *oidium* or the inferior quality of the milk that causes the disturbance, I have not demonstrated.

*Colored Milk.*—1. Blue milk has a very disagreeable taste, and when drunk will produce very severe gastritis and diarrhea. The *bacillus cyaneus* is the cause of the blue color. There are two varieties of blue milk—that which is blue when milked and that which becomes blue upon standing. The former is very slightly poisonous, while the latter is very much so. Both contain the bacillus, but the grade of toxicity is determined by the non-development of one and the maturity of the other.

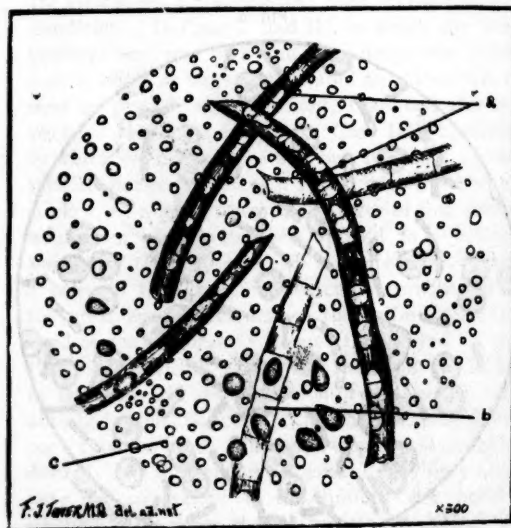
2. Yellow milk. Beside coloring matter introduced by the dairyman to make the milk appear richer, there is found a bacterium *xanthinum*, and also a *vibrio xanthogenus*, which are found in a pure culture on glycerin-agar and on nutrient gelatin to produce a yellow film; the bacterium is aerobic, so that the lower portions of the milk are apt to be free from the growing organisms, though it will contain the products and may even be more deleterious in its effects than the upper stratum. The eating of *rheum palmatum* or some of the orchids will give milk a yellow color. I have found a penicillium the spores of which are yellow growing on milk left for a few days exposed in dry places to the atmosphere, giving an appearance of grated lemon-peel upon the surface of the milk.

3. Red milk usually comes from feeding the animal madder or galium (called also bedstraw). The *spirillum rubrum* will grow on milk, though there are no cases describing such a condition. At rare times blood finds its way into milk, and gives it a reddish hue.

4. Brown milk. Among many experiments made during the past year I find that on exposing milk to the air of certain localities a fungus will occasionally be captured, the products of which are brown, which extending into the surrounding milk give it a rusty-brown color. The spore-growth of this one of the fungi presents no difference from that of the *oidium lactis*. It thrives better when a small per cent. of cane sugar has been added.

5. Green milk is very rare. It may possibly arise, under some circumstances, in ulcer of the udder, from the presence of the same organism which causes green pus, though I have not seen such a condition. Green milk as it does actually occur is due to two causes, one a physical cause and the other organismal. From the first: a very large amount of fat is found, so that the emulsion is poor, and the fat in

FIG. 3.



a. Confervæ. b. Same, sporing. c. Milk-globules.

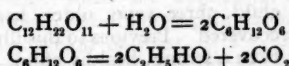
used as a coloring matter for milk, butter and cheese, but as the oil of saffron is not miscible there is slight danger from the effects of the ingested saffron.

7. Milk from a swill-fed cow I find to contain one of the confervæ, a low order of vegetable life—in fact, an alga. The fats are deficient, the milk is thin in consistency, and of a faint bluish tint,

masses throughout the milk gives it a greenish tinge. From the other: when the causes of blue and yellow milk are both active in the same milk, this appears green in color; the result is a mixed culture divisible into the two distinct varieties.

*Odors, etc., of Milk.*—The natural odor of milk is due to a minute proportion of  $H_2S$ , which rapidly leaves it, and we fail to get the faint animal smell. Owing to the presence of the albuminoid substances, *i. e.*, casein, sodium albuminate, etc., there is great liability to fermentation and to absorption of odors from its surroundings. When a quantity of milk is left exposed to any noxious gas, it becomes contaminated within a very short space of time.

The normal amphiteric reaction of milk well suits it as a medium for the growth of low forms of vegetable life. Take the torula, for instance—though cane sugar is necessary for its growth. In milk to which saccharose has been added, the yeast-plant finds a feeding-ground, and breaks up each molecule of grape sugar, into which probably the cane sugar has first been changed by a simple hydration—



the carbonic dioxide rising in bubbles and the alcohol remaining in solution in the milk. Upon this property of yeast is founded the manner of koumyss-manufacture.

If the clostridium butyricus finds an entrance into milk it changes the lactic to butyric acid, and the milk then has the faint pineapple odor of that acid. This may occur when milk is even sealed up from the air, provided the clostridium gains an entrance to the milk before sealing, for the organism is an anaërobic bacterium, and does not need oxygen for its growth.

When the cow suffers from any disease of the liver that prevents proper elimination of the bile-acids and salts, the milk will be exceedingly bitter. There is no difference between the taste of such milk and that which comes from the cow after the ingestion of leaves of the chestnut tree. When even a small quantity of the plant *symplocarpus foetidus* is eaten, the milk has an odor quite equal to mephitis itself; not so bad, but still sufficient for those who dislike onions, is the odor when any of the allia are eaten. Turnips fed to cows impart their taste to the lacteal fluid.

A few words upon the vitality of the commoner growths in milk will not be out of place in this sketch. When the alcohol in milk undergoing yeast-fermentation reaches about 6 per cent. the growth ceases—is, in fact, destroyed by its own production. This is true in all cases, but in some it takes

a much longer time for the growth to exhaust itself, as it may be slow or the organism a particularly resistant one. Organisms, if left to themselves, die or cease to grow from one of two reasons: one, when they exhaust the material in the pabulum favorable to their growth and propagation; and, secondly, when they produce a substance poisonous to not only many higher grades of life, but to themselves, as, when the torulæ produce alcohol, or the tubercle bacilli an alkaloidal substance. The vitality of the tubercle bacillus is far greater than that of any other microorganism commonly found in milk, some of which containing the bacilli may be boiled for four minutes, and if an inoculation be then made upon sterilized blood-serum, the growth, though somewhat tardy, will take place. The gastric juice does not destroy them. For a fluid medium a spit-culture is one of the best to make. Milk should always be boiled for thirty minutes, bottled, and then allowed to cool, and there will be no danger in using it. The spores of the tubercle bacillus may even be demonstrated by successive cultures though not seen in the specimen, for they do not stain in milk that contains them. Milk that has been treated with carbolic acid for fifteen hours will make successful cultures; not until from eighteen to twenty hours will the bacilli be destroyed. As a comparison of vitality the cultures of *staphylococcus aureus* are checked by a 1 to 30,000 iodine solution, while moist heat ( $100^\circ C.$ ), the best of all sterilizers, fails to destroy the tubercle bacillus in several minutes.

Now to descend upon a more practical footing, where our remarks will apply to everyday protection. Always suppose that every milk is dangerous to health as it is freshly received; boil for thirty minutes, ascertain that it contains no fungoid growths, has a specific gravity of about 1.033, contains 3 per cent. or more of fats, and approximately 4 per cent. each of lactose and albuminoids (casein, etc.).

#### RARE COMPLICATIONS OF TYPHOID FEVER.

BY EDWIN E. GRAHAM, M.D.,

CHIEF CLINICAL ASSISTANT OF MEDICINE IN JEFFERSON MEDICAL COLLEGE; PHYSICIAN TO FRANKLIN REFORMATORY HOME,

THE publication of an exhaustive article on "Rare Complications of Typhoid Fever," by Professor H. A. Hare and Mr. Arthur J. Patek, in *THE MEDICAL NEWS* of June 20, 1891, in which they report two cases of typhoid fever that were ushered in by mania, induces me to report the following case that occurred in the practice of my brother, Dr. James Graham. In this instance I am of the opinion that the typhoid fever ushered in the mania, the tendency to insanity having previously existed.

Dr. Hare and Mr. Patek clearly show that, in a disease as common as typhoid fever, mania coming



on early is an exceedingly rare complication. Might it not be that in some of the cases cited the typhoid fever was the complication, for they were mostly hospital cases, and in hospital practice the patient is apt to be a stranger, ignorant of his hereditary tendencies, or, as appears to be common to all classes, conceals insanity in his family as he would crime.

I was called June 12, 1891, to see for the first time John T., aged twenty-two years. He was lying upon a settee on the first floor, and his mother, an exceedingly nervous woman, was bathing his head. She informed me that her son imagined himself "under a spell," put upon him by the young lady to whom he was engaged to be married. He was of temperate habits, had been in good health, and at work as an employé in a store until two days previously. When upon returning home after spending the evening with some friends, but unattended with any excitement, "he had acted queerly," would not answer questions, but said that "the spell was upon him." He immediately informed me that some girl had cast "a spell upon him," but upon being questioned he remained quiet, with his eyes intently fixed on the ceiling, and did not answer or appear to hear me. His skin felt cool, and his pulse was but slightly increased in frequency. The mother reluctantly admitted that his father had been insane, and had been confined in an asylum, but knew of no other member of her own or of her husband's family who had shown any evidence of insanity. The patient was her only child.

The case appeared to be evidently one of insanity, and I advised that he be closely watched for a short time, and if no signs of improvement were shown to send him to an asylum. I was again called the following day, and, although awake and evidently conscious, he paid no attention to my questions. His mother reported that he had been excitable through the night, and that he was constipated. I ordered fluid extract of cascara sagrada. Two days later I was again summoned to see him, as he had escaped in the night while his mother was temporarily absent, and was found the next day in the station-house, where he had been locked up by the police on a suspicion of robbery, as when arrested he had a clock and some articles of female attire in his arms. Upon attempting to undress him when he arrived home his struggles were such that it required four men to control him. I did not see him until four days later—a week after my first visit. His mother, who was now quite frightened and exhausted, earnestly requested that he be transferred to an asylum. She reported that he had on several occasions been extremely violent, that four men had with difficulty been able to control him, and it had been necessary to tie him in the bed. He had also entered a neighbor's dwelling, where he heard some singing, with the intention of "clearing out the house," and was only restrained by the persuasion of another neighbor, whom he called "the Virgin." My visit had the same negative results. Accordingly the necessary papers testifying to his insanity were filled out by myself and another physician—one of large experi-

ence. Four days later I was called upon for a death certificate, but suspecting that he had committed suicide I referred the family to the coroner, and the coroner's physician, on post-mortem examination, found that he died from typhoid fever.

It was unfortunate that I had not taken his temperature, or made any notes as to his physical condition. But his temperature had seemed normal, and the case appeared to be evidently one of uncomplicated insanity. It was also difficult to get any accurate information.

The following case presents another complication that may arise during the course of enteric fever, *i. e.*, hemorrhage:

Gracie M., eight years old, died January 21, 1891, of typhoid fever, on the twenty-fourth day, apparently from exhaustion. Two sisters were taken down with the disease about the same time. Gracie had a slight initial epistaxis, and from the ninth to the thirteenth day slight, almost constant, oozing of blood from the nose, and also from the mouth, eyes, ears, vagina and anus, although these hemorrhages were less in amount, and less constant. There was no heart or kidney complication, and no history of hemophilia in the family. The bleeding did not seem to influence the course of the disease. The other child, three years older, had a milder attack and recovered. Previous to this illness Gracie had always been a strong, healthy child.

In looking over the literature of the subject I can find no case in which the hemorrhage was of such a universal character as in the case here reported. W. W. Powell<sup>1</sup> reports a case of severe hemoptysis in enteric fever ending in recovery, and not followed by any signs of disease of the lungs, either tuberculous or otherwise. William Madden,<sup>2</sup> in an elaborate discussion on the complications and sequelæ of typhoid fever, devotes only a few lines to hemorrhages from other portions of the body than the bowel, and says: "Hemorrhage in children is not so frequent as in adults, because of the superficial character of the intestinal ulcerations in the very young." Parrot relates the case of a child three years old that died from a sudden intestinal hemorrhage. He says: "Epistaxis is as rare in children as it is frequent in adults; occasionally it is profuse." Uterine hemorrhage is not uncommon. According to Beach:<sup>3</sup> "Phlebitis, arteritis, endocarditis, pericarditis, thrombosis and infarctions with their results, have been observed as occurring in connection with typhoid fever." Some of these conditions may be either complications or sequelæ, and may arise from the action of the specific poison on the endothelium, the condition of the blood or lymph, the state of the circulation, or from external pressure.

<sup>1</sup> Westminster Hosp. Rep., London, 1890, vi. 93.

<sup>2</sup> Brooklyn Medical Journal, 1889, pp. 749-756.

<sup>3</sup> Trans. N. Y. State Medical Society, 1889.

**CASES OF GASTRIC ULCER CURED BY A DIET OF ICE-CREAM.**

CLINIC OF PROF. J. M. DA COSTA.

REPORTED BY E. P. HERSHEY, M.D.,  
OF DENVER, COL.

CASE I.—In September, 1888, A. E. L., thirty-five years of age, unmarried, presented herself at the clinic. Three months previously the patient had applied for the treatment of what she considered aggravated dyspepsia. The symptoms then were localized pain in the epigastric region, more intense on pressure. The corsets had to be put aside, and later on the parts became so sensitive that the front of the dress could not be fastened. At first, food was rejected about from twenty to thirty minutes after it had been taken into the stomach; but later on, it was expelled at once. Blood appeared in the vomited matter—indeed on one occasion there was distinct hematemesis. Some weeks previously to her visit to the clinic, the patient had eaten a small quantity of ice-cream, and to the surprise of all, it was retained by the stomach. After this she constantly expressed a desire to have an unlimited quantity of this agreeable nourishment, but owing to the fears of the attending physician as to its possibly injurious effect, she was allowed but a little.

At the time when she applied at the clinic she complained of continuous pain extending from the epigastric region in front, to a point between the first lumbar and the last dorsal vertebra; the slightest pressure over either of these regions was unbearable. During the first three months of her illness, she had lost twenty-five pounds in weight. Every article suggested as a means of diet was met by the answer that it had already been tried. It was advised that the patient be given iced milk with thirty drops of the aromatic spirits of ammonia to the glassful; should this fail, rectal alimentation to be resorted to. Ten days later it was reported that the patient rejected the medicated milk, and that all artificially digested foods given per rectum were spasmodically expelled; so this means of nourishment had to be discontinued. At the suggestion of Prof. Da Costa, the patient was then allowed ice-cream *ad libitum*. No attempt at medication was made, as every drug, whether given in capsule or liquid, was vomited as soon as it reached the stomach. The occasional severe paroxysms of pain were relieved by hypodermatic injections of morphia.

After the patient was allowed her choice of diet, all severe symptoms gradually began to disappear. From two to three quarts of ice-cream were at times eaten during the twenty-four hours, the smallest quantity taken on any day having been one quart. At the end of two months, the patient had gained twenty-four pounds in weight; all severe symptoms had disappeared, and solid nourishment was gradually added to the diet, until the patient made a complete recovery.

CASE II.—One year later, another patient, M. H., a laborer, presented himself at the clinic with the same history as the case reported, except in severity, the gastric irritability being very great. He had some

weeks before discovered that the only food that he could retain was ice-cream. This article he was urged to continue, which he did for about a month, when the improvement was so great that he was put on a carefully selected diet of solid food. He also made a complete recovery. In this instance, however, medicine was tolerated, and he was given one-quarter grain doses of the nitrate of silver three times a day.

To these cases appearing at the clinic, the following, which happened in the practice of the reporter, may be added:

CASE III.—In August, of last year, a young lady came under observation with symptoms of severe pain in the epigastrium, extending as low down as the umbilicus, and throughout the left hypochondrium. There was a history of constant distress in the stomach for one year, and food was rejected as soon as it entered the stomach. Hematemesis was of frequent occurrence, and the taking of food always occasioned distressing pains. For three weeks previously to the time the case was first seen the patient had attempted to take no food other than milk and lime-water, and even this was frequently vomited. She was confined to her bed; there was decided tenderness upon slight pressure throughout the region of pain; the knees were drawn up. The temperature was 103°, the pulse 130, and weak. The ulcer had perforated the walls of the stomach, and localized peritonitis had followed. The stomach was at once put to rest; rectal alimentation was resorted to, including principally peptonized milk and beef peptonoids. Hot turpentine stupes were applied to the affected area, and opium was administered by the bowel until slight narcosis was produced. In four days all signs of peritonitis had disappeared. Upon the fifth day an attempt was made to give nourishment by the mouth. The patient was given peptonized milk, but this occasioned severe pain and vomiting and had to be discontinued. Acting then upon the experience gained from the cases reported, the patient was given a small quantity of ice-cream, pure and freshly made; this she retained, and on this diet she was kept for nearly two months, gaining rapidly in strength. The particular advantage of the diet was that it neither nauseated nor distressed her. During the third month, solid food was gradually added, until a plain substantial diet could be indulged in without distress. Following this condition, there were marked symptoms of gastric catarrh, which were greatly lessened by means of lavage.

It is most likely that the ice-cream in these cases acted partly in virtue of the cold, which, as a local anesthetic, benumbs the stomach, permitting the act of digestion to go on without pain, and the nourishment to be appropriated. In using ice-cream as a diet in cases of gastric ulcer, too great care cannot be taken in seeing that the article is perfectly fresh, and contains no corn-starch or other ingredients to thicken it. That which is over twenty-four hours old should not be used. Ice-cream may



not answer in all cases, but it will be found a most excellent article of food to resort to when other foods cannot be retained. It is a conceded fact that many cases of gastric ulcer get well of themselves, provided the stomach be kept at rest. If, then, an article of diet be given which will allow of the desired rest, and at the same time nourish the patient, we have the best means of bringing about a speedy recovery. By the presence of some food in the stomach we prevent the continued corrosive action of the gastric juice upon the affected surface, a fact that certainly should be taken into consideration when the plan of rectal alimentation is entertained.

The only objection that could be taken to this form of diet is in the risk of giving impure ice-cream. There is undoubtedly danger in the hot summer months. All such risk, however, may be obviated by allowing only that to be eaten which has been made at home.

#### A FATAL CASE OF PURPURA HÆMORRHAGICA.

BY D. J. MILTON MILLER, M.D.

PHYSICIAN TO THE EPISCOPAL HOSPITAL, PHILADELPHIA.

THE extreme rarity of rapidly fatal forms of purpura among adults, and the unusual character of the following case, are sufficient explanation for placing it upon record:

M. H., a healthy male, of splendid physique, twenty-one years old, living amid good hygienic surroundings, and of good family history, was admitted to the Episcopal Hospital on April 3, 1889. He had always enjoyed good health until his present illness, excepting an attack of typhoid fever nine years, and of gonorrhea four months, before admission. The illness on account of which he sought admission began March 29th, after exposure to cold and wet (to which he ascribed his illness), with sore throat, general malaise and aching of the bones, followed in two days by swelling in one finger, and, on April 1st, by pain and swelling of the ankle- and knee-joints; at the same time purpuric spots were noticed on the feet and legs. The symptoms progressed until his admission, when he presented the following appearance: Both ankles, the left knee, both wrists, the left elbow, and the right shoulder were swollen, painful and edematous, some more so than others; on the anterior aspect of both legs, on the forehead and about the *alæ nasi* were numerous purpuric spots, varying in size from a split pea to the nail of one's little finger. Similar spots, though larger, were noticed on the buttocks and left hip. These spots were dark-purplish in color, the larger ones slightly elevated above, the smaller ones on a level with, the surrounding skin. The left tonsil was much swollen, dark-blue in color, and the seat of great pain; the tongue was moist and clear; the bowels were constipated; there was some nausea; the temperature was 99°; the pulse was 100. On the next day, April 4th, the

hemorrhagic spots were much increased in size, especially those on the buttocks and hip-joint. This joint was swollen and edematous, painful on pressure, and presented on its outer surface a large extravasation of the size of a man's hand, while new spots and patches had appeared on the arms, abdomen and left eyelid, which was edematous and dark-blue in color. The enlargement and discoloration of the left tonsil had diminished, but a bluish patch was noticed on the uvula and posterior portion of the hard palate. The patient complained of much pain in the throat. His general condition continued good. The morning temperature was 99°, the pulse 92; the evening temperature 100.4°, the pulse 96. On the 5th the left eye was completely covered by the edematous and blackened lid; a similar process was beginning on the right. The right shoulder was twice its natural size, edematous, and covered by a large extravasation that extended up the neck almost to the ear, the area involved being of the size of *two hands*. On the right arm, midway between the shoulder and the elbow, was another smaller hemorrhagic patch, fully three inches in its greatest diameter. The other joints had diminished in size and were free from pain, while the purpuric areas about them and on the lower extremities and abdomen were undergoing the changes peculiar to subcutaneous extravasations of blood. The morning temperature was 99.6°, the pulse 96; the evening temperature 100°, the pulse 102. By noon, April 6th, the tongue was attacked and rapidly filled up the oral cavity, rendering swallowing almost impossible; its surface was livid, almost black, a large hemorrhagic patch, accompanied by swelling and edema, appeared just below the lower lip, and extended over the chin to the hyoid bone. The front of the neck was much swollen, the swelling adding to the difficulty in swallowing already caused by the condition of the tongue. The other extravasations and swellings were rapidly subsiding. The patches on the right shoulder and arm, however, had become depressed below the surface, and of a deep-black color. An enema brought away a copious tarry stool. The patient was weak and anemic-looking. The morning temperature was 100.6°, the pulse 108; the evening temperature 101°, the pulse 106. On April 7th the swelling of the tongue had subsided sufficiently to permit of some swallowing. The neck had also diminished in size. New spots were seen on the chest and back. The joint and other swellings had completely subsided, leaving nothing but the fading extravasations. The urine, previously clear, was now dark and smoky; it was, unfortunately, not examined. Slight cough was present, with blood-stained sputa. Numerous subcrepitant râles were heard over the bases of both lungs. Morning temperature was 101.2°, the pulse 108; the evening temperature 101.6°, the pulse 108. On the morning of April 8th, the tenth day of the disease and the eighth of the eruption, the patient was very weak. He expectorated abundant frothy, bloody sputa; the breathing was accelerated to 36 per minute; there was percussion dulness over the left base, where bronchial breathing and subcrepitant



râles were heard; elsewhere, throughout both lungs, there were large bubbling râles. The urine was darker, and contained a few clots. The extravasations on the right shoulder and arm were still depressed below the surface, and presented the dry and shrivelled appearance of a part about to become gangrenous—an indication that gangrene would, without doubt, have supervened had death been deferred a little longer. The morning temperature and pulse were 101.8° and 120 respectively. The dyspnea and the signs of pulmonary congestion and edema increased until death occurred at 6 P.M. Just before the end the temperature registered 103.2°, pulse 140. An autopsy was not permitted.

As to the treatment there is little to be said. At first, owing to the prominence of the joint symptoms, sodium salicylate was administered. On April 4th, when the true nature of the disease became apparent, the salicylate was discontinued, and half a drachm of fluid extract of ergot and twenty minims of the tincture of the chloride of iron, every three hours, were substituted. When symptoms of adynamia set in whiskey was added. Morphia, subcutaneously, was also given for the very intense joint pains. Upon the onset of the pulmonary symptoms the chest was frequently dry-cupped. The diet consisted of milk and meat-broths. But it is probable that, in a disease of so malignant a character, treatment of any sort would have been futile, and a report of the treatment is only added to complete the clinical history.

What was the nature of this almost fulminant attack? In the present obscurity and uncertainty surrounding the pathology and etiology of purpura, it is useless to speculate concerning the cause of the striking symptoms just narrated. Recent investigations point to a mycotic origin—either a direct action of microorganisms or the development of a poison by their growth. The impression made upon the writer as he saw this robust man sink under the external and internal hemorrhages, was the strong resemblance of the attack to the hemorrhagic form of the acute infectious diseases. So far there has been little that is convincing in the work of the advocates of the infectious nature of purpura. The researches of Martin de Gimard,<sup>1</sup> however, are more conclusive. This investigator has found micrococci in the blood of purpuric patients during life, and in the hemorrhagic patches and viscera after death. Injections of fresh blood taken from living purpuric patients into the bodies of rabbits failed to cause hemorrhages, but pure cultures in bouillon and agar-gelatin preparations injected into the cellular tissue, the peritoneum, and the veins of the ear of rabbits and of guinea-pigs gave rise to ecchymoses of the thigh and to hemorrhagic infiltrations in the peritoneum, in the capsule of the kidney, and in the small intestines. He ascribes the purpuric lesions to a mechanical obstruction of the

vessels and to inflammation of their walls from the presence of colonies of micrococci, rupture occurring spontaneously, or as a result of movements on the part of the patient. THE MEDICAL NEWS of May 23, 1891, contains an abstract of a paper by Letzerich, in which the disease is also etiologically ascribed to a microorganism, but the author does not appear, like Gimard, to have produced hemorrhages in animals. Whether or not purpura is really of microbic origin future investigation only will determine, but to the writer it seems the most likely explanation of the remarkable case reported in this paper.

## CLINICAL MEMORANDA.

### TREATMENT OF SPINA BIFIDA.

BY E. P. HURD, M.D.,  
OF NEWBURYPORT, MASS.

ON reading an article published in THE MEDICAL NEWS of May 16, 1891, by Dr. Ira K. Gardner, on "Excision of Spina Bifida," I was impressed by the fatal neglect of the operator to tie the neck of the sac before closing up the wound with sutures. Had that precaution been taken, I believe that the life of the little patient might have been saved. I speak from experience, having had a similar case in 1889, where, but for the interference of my friend, Dr. G. W. Jones, of Cambridgeport, I should have operated in the same manner as Dr. Gardner and his partner. Dr. Jones insisted on the necessity, before excision of the sac, of putting a firm chromicized catgut ligature around the neck, without which there would certainly be persistent and ultimately fatal escape of the cerebro-spinal fluid, which no amount of sutures of the integument, adhesive strips, and pressure could prevent. The operation was done as Dr. Jones suggested and the child is to-day in perfect health.

This case was reported by me in the *Therapeutic Gazette* for October, 1889, in an article with the heading "Operative Treatment of Spina Bifida." This article has received the commendation of distinguished surgeons, among whom I may mention Dr. Robert Abbe, of New York, who writes me: "Your operation, which is essentially Mayo Robson's, is the only safe one."

I will quote from this article that portion describing the operation as performed by Dr. G. W. Jones and myself:

"Wednesday, September 11. Ether was administered and the operation was performed under thorough antiseptic precautions. Once during the operation it was necessary to rally the failing heart by a hypodermatic injection of ether. An incision was made over the tumor, freely exposing the inside of the sac; the cavity was sponged out with a sublimate solution (1:2000). The glistening sac, with its arborescent nerve-filaments and median-core, was dissected or torn from its subjacent tissues till we had the entire membrane in our hands down to the foramen of entrance into the vertebral canal. Behind the neck of the sac (and by this term I mean the constricted portion before mentioned where the sac passed up into the spinal canal) was a large pulsating artery, which was carefully avoided. A stout catgut ligature

<sup>1</sup> Du Purpura Hémorrhagique Primitif. Paris, 1888.

(that had previously been well chromicized to make it more enduring) was passed around the neck of the sac and twice firmly tied and the entire sac was then excised; iodoform was freely dusted over the raw surfaces, and a continuous (buried) fine catgut suture was taken, attaching the deep layer of the skin in front to the fascia, which had constituted the posterior boundary of the sac; this running *blind* stitch was entered from above and below until it finally ended in the edges of the cutaneous flaps, which were also brought together by a buried catgut suture (blind stitched); iodoform was applied once more and the line of incision finally closed in with flexible collodion. A compress and bandage completed the operation."

It will be seen that the above was strictly a hernia operation, performed according to Marcy's methods, as described in his recent treatise on *The Radical Cure of Hernia*. The sac with its contents originally belonged to the spinal canal, and had become a hernia by protrusion through a weak place in the last lumbar arch. The foramen of exit corresponded to the abdominal ring, which gives passage to intestinal hernia.

The ligation of the sac by chromicized catgut is according to Marcy's plan of dealing with the sac of abdominal hernia, and the stitching of the deep and superficial parts together by a running catgut thread and the final closure of the cutaneous incision with catgut and collodion are also like the abdominal operation.

#### CANCER OF THE BREAST CURED BY OPERATION.

BY WILLIAM M. LEWIS, M.D.,  
OF GREENSBURG, KY.

In the autumn of 1885 Mrs. S. B., fifty-one years of age, was examined for a "lump in her breast." Her health had always been good and she was the mother of eight healthy children, all grown. Her family history was somewhat alarming, as her father died of cancer of the stomach, and an aunt died of mammary scirrhus. The patient had noticed the growth about six months before, when it was the size of a walnut. She sought medical aid on account of the rapidity of the growth. It was found to be as large as a double fist, occupying the outer segment of the gland. The nipple was retracted and the axillary glands were enlarged and slightly tender; the tumor was freely movable, but attached to the skin beneath and to the outside of the nipple, and over this portion of the gland enlarged tortuous veins were plainly visible.

The diagnosis of carcinoma was made and soon after confirmed by Dr. David W. Yandell, of Louisville, Ky. Early removal was advised, and on November 12, 1885, with the assistance of Drs. Hazlewood, Buchanan and E. J. Graham, the entire diseased gland was removed. The incisions were well away from the mass, in healthy skin and tissue, and all the axillary glands were carefully removed. A drainage hole was made at the most dependent part, and the wound brought partly together with silk sutures. Moderate pressure was applied. Healing was by very profuse suppuration. The space from which the gland was removed granulated from the very bottom. Recovery was uninterrupted, and the lady's health has continued good all the time.

Now, nearly six years from the date of the operation, a very careful examination fails to elicit a single symptom of return of the neoplasm in or near the cicatrix, or elsewhere.

This case is reported for its value in a statistical point of view, and it proves that, under favorable circumstances, cancer of the breast is curable by excision. For the benefit of those who may doubt the diagnosis I desire to add that on section the tumor exuded a milky juice, and under the microscope the characteristic stroma and cells of the scirrhus variety of carcinoma were plainly seen.

#### A VERY IRREGULAR FOREIGN BODY IN THE ALIMENTARY TRACT SAFELY VOIDED UNDER THE "POTATO" TREATMENT.

BY J. SOLIS-COHEN, M.D.,

HONORARY PROFESSOR OF LARYNGOLOGY IN THE JEFFERSON MEDICAL COLLEGE, PHILADELPHIA.

A PATIENT was recently brought to me some two hours after having swallowed the irregularly shaped dental clasp depicted full size in the figure.



Exploration of the esophagus showed that tube to be unobstructed. The patient was ordered to feed exclusively upon buttered mashed and roasted potatoes, and to examine his stools carefully for the foreign body. Within forty-eight hours the patient left the object at my office door. It had been voided thoroughly coated with potato, to free it from which several washings had been required.

NOTE.—Had this very irregular body been found impacted in the esophagus, the same treatment would have been pursued in preference to the infliction of injury upon the esophagus in efforts at forcible extraction.

#### MEDICAL PROGRESS.

*The Detection of Arsenic in Wall-paper.*—A piece of the suspected paper is placed in strong aqua ammoniac. If arsenic be present a bluish color is developed. The presence of copper would give a similar reaction. If, however, a crystal of nitrate of silver be moistened with the fluid, the presence of arsenic is revealed by the development of a yellow color.—*National Druggist*, May 15, 1891.

*Stain for the Medullary Sheaths of Nerves.*—WEIGERT (*Münchener medicin. Wochenschr.*, June 16, 1891) has recently modified his method of staining the medullary sheaths of the nerves in such a way as to obviate the chromate of copper precipitate that is so injurious to the knife, and so that a differentiation by the method of Pal, with the danger of entirely decolorizing fine fibres, is not necessary. The hardened tissue is placed in equal parts of a cold, saturated and filtered solution of acetate of copper and a 10 per cent. solution of Rochelle salts, and kept for twenty-four hours in a thermo-



stat, then for twenty-four hours more in the solution of copper. The sections may now be stained without the necessity of differentiation. The staining fluid should be strongly alkaline—seven c.cm. of carbonate of lithium solution, instead of one c.cm. The mixture of the alcoholic solution of hematoxylin and the solution of carbonate of lithium must always be freshly prepared. After the sections have been stained for several hours in the thermostat the fibres appear blue; after a longer period the fibres appear black; the background is pale-rose. If the stain should be too deep, decolorization can be done as in the earlier method. In series-sections a blue tint imparted to the celloidin can be removed by a dilute solution of acetic acid. Anilin-oil-xylol (2:1) is recommended for clearing up.

**When to Discontinue Mechanical Treatment in Hip-joint Disease.**—At a meeting of the Section on Orthopedic Surgery of the New York Academy of Medicine, DR. NEWTON M. SHAFFER called attention to the difficulty which often existed in deciding when to discontinue mechanical treatment in hip-joint disease. The following conditions contra-indicated the removal of the apparatus: If manual concussion produces pain or flinching; if there is considerable deformity without ankylosis; if there is a true joint-limp, or if there are abscesses or sinuses connected with the joint; or if there is a true reflex muscular spasm, limiting movement slightly in all directions; if there is almost perfect flexion, with the other movements considerably or markedly limited; if flexion, abduction and adduction are excellent, with rotation and extension limited; and, finally, if all the movements are almost normal, except rotation inward during flexion (the limitations being due to the neuromuscular protection).

**The Pathology of Diabetes Mellitus.**—At the Tenth Congress for Internal Medicine, at Wiesbaden, SANDMEYER (*Deutsche medicin. Wochenschr.*, June 18, 1891) reported a fatal case of diabetes in a boy nine years old. The disease was first recognized at seven years of age. In the terminal coma, diacetic and oxybutyric acids were found in the urine. The urine contained but a trace of albumin, but many casts. A history of syphilis and an hereditary predisposition to diabetes were excluded. The autopsy was made seven hours after death. The pancreas was carefully examined, but no changes were found. The floor of the fourth ventricle was normal. Microscopically, the kidney presented evidences of glyco-genic degeneration and characteristic fatty degeneration of its epithelium. The heart was involved in fatty degeneration.

**Sterility in the Adipose.**—KISCH (*Wiener Medizin. Presse*, No. 21, 1891) has observed, both in man and in animals, that the adipose are especially prone to be sterile. This he ascribes to physical difficulties in the way of a perfect execution of the sexual act, to deficiency in number and virility of spermatozooids in the seminal fluid on the part of the male, to menstrual derangements on the part of the female and to diminished sexual desire on the part of both male and female. The prognosis is not unfavorable, if a rational therapeutics be instituted, directed to a reduction of the excessive deposit of fat, and

to a removal of local pathological conditions in the genito-urinary tract.

**Senile Chorea.**—A woman, seventy years old, was admitted into King's College Hospital, London, under the care of DR. FERRIER, with typical choreic movements of the right side of the body, face, arm and leg. She passed a sleepless night, and on the following day became maniacal. Under treatment with chloral, bromide, quinine and arsenic, recovery ultimately took place. The patient had no history of acute rheumatism, nor was there a family history of either rheumatism or chorea. The patient, herself, had eleven months previously had an attack of left-sided chorea that came on gradually and lasted two months.—*Lancet*, June 20, 1891.

**Acute Hypertrophy of the Mammary Glands.**—CROFFORD (*American Journal of Obstetrics*, June, 1891) reports the case of a girl, fifteen years old, in whom the breasts attained such proportions that, other means failing, amputation was performed. When removed, the right breast weighed thirteen pounds, the left eleven and a half. The tumors appeared to have been nourished by the superficial rather than by the deep vessels. Microscopically, the condition was found to have been an acute diffuse hypertrophy or fibro-adenoma.

**Classification of Mental Disease.**—DORNBLÜTH (*München. med. Wochenschr.*, June 2, 1891) makes the following classification of the primary forms of mental disease: (1) Melancholia; (2) mania; (3) acute insanity (*verwirrtheit*); (4) acute dementia; (5) paranoia; (6) periodical insanity; (7) neurasthenic insanity; (8) hysterical insanity; (9) hypochondriacal insanity; (10) epileptic insanity; (11) acute delirium; (12) progressive paralysis (dementia paralytica); (13) cerebral syphilis.

**The Refuse of Cities.**—According to an abstract in *The Sanitary News*, July 4, 1891, the town of Chelsea, in England, since two years, disposes of its refuse by a method of sifting, grinding and incineration, by which the utilizable portion of the materials collected is separated from the useless. Special devices overcome the nuisances that would otherwise arise from the dissemination of bad odors and from the smoke generated. The products obtained are used as fuel, for making brick and paper pulp, and for fertilizing purposes.

**Fracture of the Clavicle from the Recoil of a Rifle.**—SIMPSON (*Edinburgh Medical Journal*, June, 1891) reports the case of a man, thirty years old, in whom, after engaging in rifle practice, a transverse fracture of the right clavicle was found. Instead of holding the butt of the rifle close to his shoulder, he rested the upper end of the butt on the most prominent portion of the clavicle, so that in firing the whole force of the recoil came upon the clavicle.

**Nitroglycerin for Asphyxia.**—In a case of asphyxia from the inhalation of illuminating gas, HOFFMANN (*Allgem. med. Ztg.*) succeeded in relieving the symptoms by the subcutaneous administration of nitroglycerin in doses of a hundredth of a grain. The injection was made in the precordial region, and was followed by marvellously prompt results.—*National Druggist*.



# THE MEDICAL NEWS.

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SATURDAY, AUGUST 8, 1891.

### THE BRITISH MEDICAL ASSOCIATION.

IT is with pleasure that THE NEWS presents to its readers to-day a partial report of the proceedings of the fifty-ninth annual meeting of the British Medical Association, held at Bournemouth, July 28th, 29th, 30th, and 31st. The magnitude of the meeting and the importance of its work are indicated by the large number of sections that participated, together with the enormous number of papers presented by a long array of names distinguished in every department of medicine. Emanating from a body having a membership of nearly fourteen thousand, these papers deserve the careful consideration of progressive men and women of the medical profession in all parts of the world.

That the American medical profession should have in its hands a report of the addresses made in the various sections, a little later than a week after their utterance, is a matter for sincere congratulation and is an evidence of the strong bond that unites the medical profession of the two greatest nations of the world, having in common more than a common language.

One cannot avoid being struck by the conservative tendency displayed in most of the principal papers, which stands out in contrast to the radical sentiment that pervades the medical thought of the day.

### FATHER MOLLINGER.

THE interest in FATHER MÖLLINGER, of Troy Hill, Pittsburg, concerning whom allusion was made in THE NEWS of June 27th, seems to have both abated and changed in character.

Concerning the reverend Father's personality, etc., we are permitted to quote the following from a private letter written by one of Pittsburg's best physicians:

" . . . in point of fact, FATHER MOLLINGER is like the regulation prophet in having more honor outside than inside his own bailiwick. I have a limited acquaintance with him. The man has an imposing presence, and a head that would make a study for an artist. A man of large and powerful frame, and the voice of Boanerges. Withal he is highly educated, ranking a fair knowledge of medicine among his accomplishments. In addition he has an innate love of the beautiful, and spends large sums in purchasing 'rich and rare' materials and objects and precious relics with which to decorate the chapel he has built, and which is perhaps unique in this country.

"FATHER MOLLINGER is a shrewd man, and I believe prescribes for almost all cases. The impression I formed of him was that he was not inclined to quackery, but that as a religious teacher he was bound to believe (with sincerity, I thought) that 'the prayer of faith will save the sick.'

"When you add to the influences I have alluded to, the fact that his advice was, ostensibly at least, gratuitous, it is not much wonder that his *clientèle* increased to considerable dimensions. But, after all, it was printer's ink that 'did the business.' As St. Anthony's Day (his patron saint) approached the number of pilgrims to 'Mount Troy' gradually swelled, chiefly I think owing to the persistent work of sensation-hunting reporters. When the great day passed there was a sudden collapse.

"As I have said, I think that several years ago FATHER MOLLINGER's actions were unexceptionable from his point of view. As to his course more recently, I am inclined to think that (if one may compare small things with great) he has been going through a psychological experience something like that of Savonarola. He has been forced by the adulation—I might say, the adoration—of his devotees to do things which would seem to predicate the possession of miraculous power. For example, he would place his hands on the eyes of the incurably blind, or on the limbs of the hopelessly para-

lyzed, and go through some form of invocation, the unfortunate sufferer in the meantime momentarily expecting an exhibition of Divine power in his behalf. Of course, no miracles were performed, and of course, therefore, many who were devout believers are equally devout skeptics to-day."

Peculiarly interesting facts in reference to FATHER MOLLINGER are, that he was a regularly graduated and practising physician (in Germany) before becoming a priest, and that, together with the laying-on of hands and the invocation, he now gives medicines—of what kind does not appear—and that the patients send back for "renewals" from their distant homes.

The *Pittsburg Commercial Gazette* has been getting reports of the alleged cures, and, according to its correspondents and summaries, FATHER MOLLINGER'S cases of cure are very difficult to find. Three cases were especially famous, but the patients could not be found at their supposed homes. In Nashville, Tenn., of the fifty or one hundred patients, "each one can tell of someone else who was cured, but when the one designated is found it is discovered that he or she is far from well." Several deaths are reported as following soon after the visits to Mount Troy, due undoubtedly to the strain, exhaustion, and excitement of the journey and its circumstances.

The *Pittsburg Medical Review*, in an excellent editorial comment, says:

"It is to be hoped there were some real cures of imaginary diseases and some imaginary cures of real diseases, to offset the great sacrifice those poor people had made in coming so far. The great majority were of the very poorest classes. They had invested their money as in a lottery, each hoping to be one of the very few who would depart sound again. Many must have been made worse by travel, which is never comfortable to the poor or the sick, as well as the discomforts of their stay in Pittsburg. After their return home they will miss the comforts which might have been had for the money thrown away on an illusory hope."

The history of the whole affair is provocative of serious and pathetic reflections, but its interest and value for physicians must still remain that which has already been pointed out: the power of the imagination and the will over morbid processes and weakened functions, and the capability of a dominant faith and a commanding personality to develop in the patient such volitional control and reaction.

## SOCIETY PROCEEDINGS.

### BRITISH MEDICAL ASSOCIATION.

*Fifty-ninth Annual Meeting, held at Bournemouth, July 28, 29, 30, and 31, 1891.*

#### FIRST DAY—JULY 28.

THE PRESIDENT, J. ROBERTS THOMSON, M.D., F.R.C.P., delivered an "Address of Welcome." He discussed the climatological advantages of Bournemouth, but devoted himself especially to the subject of sanitary legislation.

#### SECOND DAY—JULY 29.

T. LAUDER BRUNTON, M.D., D.Sc. Edin., LL.D. Aber., F.R.C.P., F.R.S., delivered the "ADDRESS IN MEDICINE," in which he took up the changes in the medical profession in the last twenty-five years.

He noted that a great increase had occurred in the knowledge of the nature, causation, and treatment of diseases, and a greater gain in the general adoption of the experimental method by which most of our recent knowledge has been acquired, and from which we may hope even greater advantages in the future. There is also a corresponding alteration in the teaching of medicine, in that instruction is practical instead of theoretical.

He referred to the profound influence that the doctrine of evolution had exerted upon medicine, as a subdivision of biology. As to the changes that had taken place in medical students he stated that there is no other class in which one can find so many gentlemanly, thoroughly well-educated and hard-working men. The struggle for professional existence has become a severe one. Its cause is to be found in the excessive number of men who have been entering the profession notwithstanding the barriers raised by the entrance examination; for this very barrier, by raising the quality of the men, has naturally raised the estimation in which the profession is held, and has, therefore, made it more attractive. But the excessive severity of the struggle, on the other hand, has a tendency again to lower the profession by rendering it so difficult for medical men to make a bare living that they are sometimes tempted to think more of their fees than of the welfare of their patients, and occasionally to resort to such means of making money as tend to bring discredit both on themselves and on the profession to which they belong.

Long ago the doctor's means of diagnosis consisted in inspecting the tongue, feeling the skin, counting the pulse, shaking the urine, and looking at the motions and the sputum. But now, in addition to a thorough training in auscultation and percussion, students have to learn the use of the laryngoscope, ophthalmoscope, and otoscope, and the application of electricity. They have to acquire a knowledge of the chemistry of the urine and its alterations in disease, and, what takes still more time, they have to learn the microscopical appearances, not only of the tissues and excretions in health, but their alterations in disease, and must be acquainted with the methods of staining so as to detect tubercle-bacilli and other disease germs.

Increased knowledge of diagnosis has led to an apparent change in the mortality of different diseases. Thus, the frequency of death from heart disease appears to be much greater and that from apoplexy much



smaller now than fifty years ago. In all probability this difference is not real, but only apparent, and is due to the more accurate diagnosis by which the presence of cardiac disease is now ascertained. The supposed increase in the frequency of carcinoma is probably in great measure due to a similar cause; for it is probable that many cases which were formerly classed as chronic diarrhea, dysentery, jaundice, or dropsy, depended upon malignant disease, while others probably depended upon unrecognized disease of the kidney, for until recently little attention was paid to the condition of the urine.

But real changes, as well as apparent ones, have occurred in diseases. Some have become more frequent and others are rarer. Thus, typhoid fever is almost certainly more common, because the increase of our sewage system has given greater facilities for its spread. Typhus fever, on the other hand, has become comparatively rare. Pyemia is another disease which, although not totally extinct, is very greatly lessened in virulence.

The departments in which the greatest advances have been made within the last five-and-twenty years are those of fevers and diseases of the nervous system. A new era in the study of the latter was foreshadowed by the experiments of Fritsch and Hitzig on the brain of the dog, but it can only be said to have fairly begun with Ferrier's localization in the brain of monkeys of the cortical centers, both motor and sensory, for the brain of the dog was too unlike that of man for experiments upon it to be of much practical use in the diagnosis of human ailments, while the likeness in the brain of the monkey to that of man at once allowed conclusions drawn from the experiments upon the former to be transferred to the latter. Yet if we try to describe in one word the department in which medicine has made the greatest progress within the last quarter of a century, that word must be "fevers;" for during this time we have learned to recognize fever by the use of the thermometer in a way we never did before; we have learned the dependence of the febrile process in the great majority of cases upon the presence of microbes in the organism, and we have become acquainted with an immense number of chemical substances that have the power both to destroy the microbes and to regulate the febrile process.

Though previously used, it is only within the last five-and-twenty years that the use of the thermometer has become at all general. The constant employment of the instrument shows when the temperature of a patient is rising so high as to be dangerous, and affords an opportunity for the use of antithermic measures, such as cradling, cold sponging, cold affusion, cold baths, or by the administration of antipyretic remedies.

The thermometer has not only enabled us to detect the onset and to watch the progress of fever, but in conjunction with microscopical research, physiological experiment and chemical analysis it has enabled us to gain a fuller knowledge of the nature of the febrile process itself. We know that during it the organism is consuming rapidly, like a candle burning at both ends. We have learned also, to a great extent, the necessity for the elimination of the waste products, or ashes, as we may term them, which the excessive combustion produces, and thus we know why the surgeon is so anxious regarding the result of an operation when the kidneys of his patient are inadequate. For if any febrile attack following the

operation should lead to increased demands upon these secreting powers, they might fail to meet it, and the retained excreta would poison the patient.

The rapid increase in our knowledge has been due not merely to the constant use of old methods, but to the introduction of new ones. The greatly increased powers of the microscope and the better methods of illumination have been of the greatest service, but their utility would be very much less than it is had it not been for the general introduction of the microtome and the invention of new methods of staining. The facility with which sections are made by it has made microscopical research much less tedious, and has enabled trained histologists to do more work in a given time, and medical students to acquire knowledge more rapidly. But without the method of staining introduced by Weigert and Ehrlich, we should, even with the best microscopes, be unable to recognize most of the microbes that are so important in the causation of disease.

From the cupidity of the Spaniards, which led them to cut down the cinchona trees of the Andes in order to fill their pockets with the gold they received in exchange for the precious bark, while their stupidity prevented them from planting new trees to replace those which they felled, quinine became so dear that attempts were made to produce it artificially. These were unsuccessful, but out of them came the discovery of the anilin dyes, so useful in histologic and bacteriologic study, and the other antipyretics, salicylic acid, acetanilide, antipyrin, phenacetin, etc.

From a study of the factors responsible for the variability in crystalline form of tartaric acid, Pasteur was led to look to life and to living beings as the source of asymmetry. He tried to produce this asymmetry in salts of tartaric acid by fermentation, and found that during the process an organism developed that eats up the dextro-tartaric acid, and leaves the lavo-tartaric acid behind. This led him to investigate such minute organisms, and, by simplifying the soil in which they grew, and separating the organisms one from another, he learned the conditions of their growth, and showed that most processes of fermentation were due to the presence of living organisms.

Fermentation is dependent upon both chemical and biological activity, respectively. Thus diastase is not a living organism, while yeast is essentially vital. Living organisms may, however, be active by the development of chemical ferments, which may be effective (in lesser degree) in the absence of the organisms.

Pasteur next established the dependence of the silkworm disease and of anthrax upon the presence of specific microbes which could be transmitted and communicate the disease, and by destroying the infected eggs of the silkworm he eradicated the disease and restored the silk-industry to France.

He also found that the germ of anthrax could be cultivated outside the living body and grown in flasks under varying conditions, some of which were favorable and others unfavorable to its growth. High temperature enfeebled the virus, so that it no longer killed an animal with the same certainty, and by inoculating first with a weak virus and then with one successively stronger and stronger, he found that animals could be completely protected either from inoculation by the strongest virus

or by infection from other animals suffering from the actual disease.

Another extraordinary fact which he made out was that the virus, thus weakened so that it will not kill a guinea-pig a year old and still less a sheep or ox, may again be rendered most potent by inoculating a feeble animal, such as a guinea-pig a day or two old, and, from this, older and stronger guinea-pigs, the strength of the disease-germs increasing with every inoculation, until finally sheep and cows may be killed by it. We can thus see how an epidemic of disease beginning sporadically and attacking weak individuals may gradually acquire such strength as to carry off the strongest.

The next step in progress was Koch's utilization of transparent gelatin as a culture medium. It thus became possible, from day to day, to study the growth of the germs and to make pure cultures. In this way it became possible to study the life-history of the organism, the influence of soil, temperature, moisture, and other influences upon its growth, and the effect of one organism upon another, when both are grown together. Thus it was found that certain germs were not compatible with one another, while others rendered the soil favorable for the development of still others. Then there is also a conflict between germs and cells that is apt to be influenced by external conditions. In this may be included the phenomenon of phagocytosis.

This process of phagocytosis is now regarded by many as only a small part of the struggle between an organism and a microbe, but it is impossible to see one part of a microbe half-digested by the cell in which it is imbedded, while the outside half remains unaltered, without believing that the process is one of great importance. At the same time, it seems that the process of phagocytosis, where the microbe and the cells meet in close conflict, bears about the same relationship to the total struggle that a bayonet-charge bears to a modern battle. The main part of the fight is really carried on at some distance by deadly weapons, by bullets in the case of the soldier, and by ferments, poisonous albumoses, and alkaloids on the part of the cells and the microbes.

In the last few years increasing attention has been paid to chemical investigation of the ferments and poisons produced by microbes.

It is now possible to separate the albumoses and poisons from the microbes which produce them, either by filtration or by destroying the microbes by graduated heat; for, as a rule, they are destroyed by a lower temperature than the albumose or poisons which they form.

As the albumoses produced by microbes are nearly allied, chemically and physiologically, to those formed in the alimentary canal of the higher animals by digestive ferments, it is natural to suppose that microbes, like the higher animals, split up proteids, starches, and sugars by enzymes, which they secrete, and which in both cases may be obtained apart from the living organisms which produce them; that, in fact, we should be able to isolate from microbes bodies which correspond to pepsin or trypsin, just as we can isolate these from the stomach or pancreas of an animal. In some, although not in all cases, this attempt has succeeded.<sup>1</sup>

<sup>1</sup> Vide Brunton and Macfadyen, Croonian Lectures on Chemical Structure and Physiological Action, British Medical Journal, June 15, 1889, p. 1336.

The albumoses produced by microbes resemble those formed during normal digestion in being poisonous when injected directly into the circulation, although they may not be so greatly absorbed from the intestinal canal. One of the most remarkable discoveries in regard to albuminous bodies is the fact that some of them which are perfectly innocuous, and, indeed, probably advantageous to the organism in their own place, become most deadly poisons when they get out of it.

It is possible that one form of albumose may neutralize the action of another, thus rendering both innocuous, while either alone may be a deadly poison.

Perhaps a similar process of splitting up and recombination may explain the formation and disappearance of the enzymes, such as pepsin and trypsin, by which digestion is carried on. The pancreas of a fasting animal will not digest albuminous bodies like fibrin, while the pancreas of an animal killed during full digestion will do so rapidly. Yet the fasting pancreas contains the zymogen, or mother-substance, which yields the digestive ferment, and, as Kühne has shown, by treating it first with acid and then with alkali, it becomes active. Lépine has lately shown that while the pancreas is pouring into the digestive canal a ferment that will form sugar, it is at the same time pouring into the circulation another ferment that will destroy sugar.

Immunity is probably a complex condition, not dependent upon any single factor. If a microbe has gained an entrance into an organism, and produces a proteid or an albumose poisonous to the organism which it enters, it may grow, thrive, and destroy that organism, while the injection of some other proteid that would neutralize the poison might save the animal while the microbe would perish.

Hankin has found that while a mouse inoculated with anthrax will die within twenty-four hours, a rat resists the poison altogether; but if the mouse, after being inoculated with the disease, has a few drops of rat's serum injected into it, instead of dying, as it otherwise certainly would, it survives just like the rat; from the spleen of the rat Hankin has isolated a proteid that has a protective action similar to that of the serum.

Injections of goats' blood and of the serum of dogs' and of goats' blood have been applied to the treatment of tuberculosis.

It is possible that the good derived from blisters is dependent not only upon an influence exerted upon the circulation, but also upon a sort of endermatic administration of proteid matters derived, no doubt from the blood, but altered in their passage from the vessels to the surface of the skin, so as to have an effect upon the body entirely different than if they had remained in their ordinary place.

It is possible, too, that the good effects of bleeding may be due to a similar cause. Experiments upon animals have shown that withdrawal of blood from the veins causes absorption of proteid matters from the tissues, and these may have an action of their own upon the blood and tissues generally with which they are thus brought into contact. Indeed it is possible that free purgation may act in the same way.

Paré rendered surgery a great service when he prescribed the application of ointments to wounds; but Lister rendered a greater when he recognized that the



danger of operations was due to the entrance of germs and, by preventing this, he has completely revolutionized surgical practice; nay, more, he has, to a great extent, revolutionized medicine, for the diseases of the internal organs that were formerly entirely under the physician's care are now becoming amenable to surgical treatment, and diseases of the stomach, intestine, liver, kidney, and lungs, and even of the brain and spinal cord, are now successfully treated by surgery when medicines are powerless to help.

Not only in surgery, but also in infectious disease, has the recognition of disease germs as a source of danger to the organism led to their destruction outside the body and insured safety from their attack.

So long as people were ignorant of the causes of epidemic diseases, they were utterly unable to combat them; but once an epidemic is known to depend upon the presence of a certain organism, precautions can be taken for destroying the organism outside the body by means of disinfectants, or by inoculation lessening the susceptibility of the organism to its ravages inside the body, or combating its effects by means of antipyretics.

In comparing the drugs at our disposal now with those we possessed twenty-five years ago, we are at once struck by two facts, namely, that we not only have a very much larger number of powerful remedies than before, but that we also know better how to use the old ones. Both of these gains we owe to experimental pharmacology, to the testing of drugs upon the lower animals.

Every now and again a loud outcry is raised against vivisection, partly from ignorance and partly from prejudice. Many—probably most of those opposed to experiments on animals—are good, honest, kind-hearted people, who mean well, but either forget that man has rights against animals as well as animals against man, or are misled by the false statements of the other class. These—namely, those who, blinded by prejudice, regard human life and human suffering as of small importance compared with those of animals, who deny that a man is better than many sparrows, and who, to the question that was put of old, "How much, then, is a man better than a sheep?" would return the reply, "He is no better at all"—such people bring unfounded charges of cruelty against those who are striving, to the best of their ability, to lessen the pains of disease both in man and also in animals.

To experimental investigation in animals we owe, in addition to other valuable information, in great measure, our power to lower temperature, for to it is due not only the introduction of new antipyretics such as salicylate of soda, antipyrin, antifebrin, and phenacetin, but the extension of the use of quinine from a particular kind of fever—malaria—to other febrile conditions.

Perhaps the most promising thing about pharmacology is that we are now just beginning to gain such a knowledge of the relationship between chemical structure and physiological action that we can, to a certain extent, predict the action of a drug from its chemical structure, and are able to produce new chemical compounds having a general action such as we desire—for example, anesthetics, soporifics, antipyretics, and analgesics.

But the excessively rapid development of medicine and medical science requires that those who are entering the profession should not only be taught the things

that we know now, but should be so trained as to enable them to keep more or less abreast of medical progress. This can only be done by giving them a thorough grounding in chemistry, physiology, general pathology, and pharmacology; and this training must be essentially of a practical nature, not only in the way of demonstrations, but of actual work on the part of the student himself.

#### THE SECTION OF SURGERY.

JOHN WARD COUSINS, M.B. Lond., F.R.C.S., delivered an address on "Recent Advances in the Treatment of Tuberculous Diseases of the Joints." After considering the historical aspect of tuberculosis of the joints, he briefly discussed the old pathology of tubercle and the relation of the scrofulous diathesis to tuberculosis. The modern pathology of the disease was then taken up and the subject of hereditary transmission considered. It was held that, as during the early stages of joint-disease the morbid action is often localized, arrest is at least possible. There can be no reason why a joint or a bone should not recover, and the tuberculous infiltration subside and ultimately shrivel into a fibrous scar just like a similar deposit in the apex of a lung.

Expectant treatment can be carried out under favorable circumstances, combining rest and protection of the limb with fresh air and exercise. By the use of suitable apparatus, injury can be avoided, while the necessary rest is secured.

Tuberculin has yielded unsatisfactory results.

In some cases, early operative interference has done good.

Whenever the indications for surgical interference are clear, early operation must be attended with many advantages. The risk of delay is always in proportion to the progressive and obstinate character of the disease, and timely aid will often prevent its extension, and at the same time deliver the patient from the danger of deep infection and the development of secondary tuberculous centers. The only hope of cure must depend upon the complete removal of the diseased tissue, and the facility with which this can be accomplished rests entirely upon the extent of the local mischief. The preservation, too, of useful mobility in the joint may be anticipated when the morbid process is well localized, so that the manipulation involves only a limited excision of the synovial membrane and a partial division of the fibrous capsule.

For the successful performance of a partial arthrectomy there must be clear evidence of a localized deposit. In some cases, children have exhibited very little pain or lameness, but the joint has been in some part swollen, with the capsule thickened and the bones enlarged, but without any indication of softening or suppuration. By a well-directed operation, near the neck of the femur or the head of the tibia, search has been made for a spot of tuberculous infiltration, with the result that a carious cavity has been found and small sequestra successfully removed.

Another recommendation for early arthrectomy is the little danger that attends the operation. With ordinary surgical precautions the risk may be fairly considered trifling, even when a portion of bone has to be resected. After a full incision in the most convenient position for exploration and carefully defining the disease, the infil-

trated tissue must be excised with the scissors or cutting spoon, and the cavity thoroughly flushed with hot water. To insure rapid union, the surface should then be dried and the wound closed with deep and superficial sutures. The limb must be kept at rest until the healing process is complete.

The articular cartilages are seldom the seat of primary disease, for as a general rule the morbid process has its origin either in the synovial structure or the articular extremity of the bone. When the osseous tissue is the seat of a tuberculous infiltration, the evidence of its existence is often wanting until softening occurs in it and inflammatory reaction takes place. As soon as these infective changes reach the synovial membrane they extend to all the structures of the joint. Sometimes they make their way through the superficial cancelli to the outer layer of the bone, and then superficial caries and slow suppuration are the result. At another time the morbid process advances in the direction of the articular cartilage, softening and erosion of this structure follow, and then inflammatory changes which, unless checked by surgical treatment, issue in chronic abscess, caries of bone, imperfect arrest of the disease, and finally ankylosis. Now in all these forms of advancing tuberculous disease, surgery offers the only scientific method of treatment, and we can safely repeat our incisions, scoopings, scrapings, and cleanings until the disorder is eradicated and a useful joint preserved. But instead of a slow disorganization, the tuberculous center may be suddenly discharged into the capsule, diffusing the infective material over the whole synovial surface, and kindling suppurative inflammation with great rapidity.

In the performance of complete arthrectomy in more advanced cases in which the morbid process is too extensive for any partial operation, a free division of the ligaments and capsule is necessary for the exploration of all the recesses of the articulation, and the excision of deep infiltrations of the synovial and osseous structures, so that the preservation of only a limited mobility must be anticipated. The whole of the pulpy granulation-tissue must be dissected off, and the ligaments and cartilages carefully scraped. It is absolutely necessary to remove every particle of the diseased synovial membrane, and all tuberculous foci in the bones must also be cleanly cut out with the gouge. Care must be taken to prevent any remnants of the infective tissue being left behind on the raw surfaces, and the accidental re-inoculation of the disease through the medium of the fresh incisions. The method of flushing with hot water the seat of operation is the best way of carrying out these important precautions. The operation of arthrectomy of the hip can be readily performed by the anterior and vertical incision and division of the neck of the femur with the saw, and then the excision of the infiltrated tissues. After a simple protective treatment for a few weeks, and the application of a Thomas splint during convalescence, the results are often very satisfactory.

In performing complete arthrectomy of the knee-joint, the old horseshoe incision and an oblique division of the ligamentum patellæ constitute a better method than any other for obtaining free access to the interior of the cavity. The practice of lifting up the tuberosity of the tibia, instead of division of the tendon, may be found very useful in some cases. It is important to carefully clean

the lateral and crucial ligaments, and to avoid damaging the cartilages and articulating surfaces. Sometimes carious bone outside the capsule of the joint can be removed with the gouge. It must always be our object to secure the complete extirpation of the diseased structures, and to preserve as far as possible the mobility of the articulation. Fortunately, the limb is not shortened, and the development of the bones is scarcely impaired. The articulating surfaces are in a great measure preserved, and the operation, when compared with resection of the joint, is attended with less risk of life.

Complete resection at once is to be preferred in all cases with old sinuses and the carious remnants of old infiltrations. The joint is freely opened, and as thin a layer of bone as possible is removed from all the articulating surfaces. The gouge is used for cleaning out any infiltrations, and then the patella is divided vertically with the saw. After cleaning every recess in the capsule, the bones are jammed together as tightly as possible, the periosteum is carefully sutured, and the wound closed, except at the extreme ends of the incision.

Conservative surgery in the advanced stages of the disease is not to be advocated, not from the dread of deepening the general and local infection from re-inoculation through the seat of operation, but rather from the feebleness of the vital power, which has been slowly undermined by prolonged suffering and suppuration. The intensity of the disease has been quickened by a chronic septic condition of the system, and it is the danger of its sudden aggravation, even with every possible precaution, which adds to the risk of surgical interference. The microorganisms of septicemia, or their poisonous products, exert a marked influence over the course of tuberculosis, for their presence reduces the resisting power of the system, and helps on the local and constitutional spread of the disease.

But it is not only septic infection in its various forms that we have to combat, but every other kind of acute disorder of the blood. Children especially are liable to be attacked with any of the infectious fevers; and these are all attended with peculiar risks. Measles, from its disturbing influence over nutrition, is prominent among the group, for its power of rekindling tuberculous inflammation.

Occasionally, however, experience has seemed to point in the opposite direction, and an accidental blood-storm has exercised a remarkable effect on the course of the malady.

Now, notwithstanding the risk of late operations, exceptions occasionally occur in practice when interference appears to be the better course. There are certainly cases of chronic tuberculous joint-disease marked by secondary centers and general infection, and even aggravated by a chronic septic condition of the system, in which the vitality of the tissues and the residue of constitutional vigor appear sufficient to warrant an effort in the direction of conservative surgery.

#### THE SECTION OF OBSTETRICS

was opened with an address by WILLIAM J. SMYLY, M.D. He maintained that gynecology and obstetrics are so intimately related that it is at times difficult to distinguish the line of separation. He cited a number of cases from practice illustrative of his view.



He would not deny to any man the right to limit his practice as he might see fit; but he maintained that, in teaching, gynecology must not be separated from midwifery; this isolation places such difficulties in the way of students, that practical midwifery is not efficiently taught, and the study of gynecology is more or less optional. Clinical teaching can be efficiently carried out only in the wards of a hospital, where too a limited material can be utilized in teaching a number of pupils.

Another important matter is accurate clinical observation, and this can only be carried out in hospitals. It was from observing the comparative mortality in two lying-in hospitals that the cause of puerperal fever was discovered and its prophylaxis pointed out. Puerperal fever is a preventable disease.

In conclusion he gave an account of a septic outbreak that occurred in the Rotunda Hospital, and of the measures taken to eradicate the disease. A patient was permitted to be examined abdominally by any number of students, but vaginally by three only and one pupil midwife. Previously to examination, the external genitals were carefully washed with soap and water, irrigated with plain water, and finally bathed with corrosive sublimate solution, 1 in 500. The examiners' hands were thoroughly cleansed with soap and water and a good nail-brush, the soap removed by carbolic lotion, then the hands washed in sublimate solution. A patient in whom premature labor was induced died of acute septicemia. Subsequently a number of cases presented considerable elevation of temperature. In consequence, vaginal examinations were temporarily abstained from. The temperature was still abnormally high in some instances. Analysis showed that, to avoid infection by the nurse, each patient washed herself. This was changed, and the dressing was done by the nurse with antiseptic lotions. Matters now improved. No unusual elevation of temperature and no further death occurred.

#### THE SECTION OF PSYCHOLOGY

was opened with an address by P. MAURY DEAS, M.B. London. He devoted himself to a consideration of lunacy-legislation in England, pointing out its defects and inconveniences, and indicating the lines along which reforms may be instituted.

#### THE SECTION OF PATHOLOGY

was opened with an address "On the Uses and Prospects of Pathology," by W. HOWSHIP DICKINSON, M.D.

In times not very remote, little was known of pathology but rough morbid anatomy, and very little of that. Large morbid anatomy has advanced so much, especially during the last hundred years, that it may be believed that there are few changes obvious to the naked eye which have escaped notice. Rough morbid anatomy is the groundwork of medicine, and must ever be essential to the physician as presenting results in a compendious form.

Of the more substantial organs, we probably know something which, though rough, cannot be altogether wrong. Within the last half-century the minute morbid anatomy of the nervous system has been begun, and some lines of light, however dim and narrow, projected into places dark since the creation. Diseases once thought to be functional or without organic change have

been provided, some, like essential paralysis, chorea, and diabetes mellitus, with something of morbid anatomy, however incomplete; while others, like tetanus and the paralysis of Landry, have been suspected, if not convicted, of being connected with poisons which, though less visible, are not less material.

The subject of embolism was briefly referred to, and that of suppuration taken up.

The loss of leucocytes, under the name of pus-corpuscles, explains the relation of blood and pus—hitherto a mystery; and the lardaceous deposit as a consequence gives a morbid interest in what is left.

In the past, many diseases have been attributed to either too much oxygen or too little, which was considered with too little regard to the vital action of the organism. The chemical school saw in inflammation only excess of oxidation or combustion, which may truly exist, and of which the increase of temperature may be a result; but it took too little account of what may be antecedent to this in tissue and vessel. In diabetes it saw little more than a deficiency of oxidation, which indeed there may be, but which must be secondary to changes in organic structure which as yet we have seen but imperfectly.

With regard to gout and uric acid as products of sub-oxidation, the chemists have reached results seeming to embrace the truth less incompletely, though even now there is probably something to learn of organic lesion or disturbance outside the domain of pure chemistry. We know something of hepatic disturbance in connection with uric acid. What more will be added, and to what organs and tissues it will relate, is work for the future.

Hemoglobinuria is closely allied to the symmetrical gangrene of Raynaud, and is associated with localized lividity of the skin. It is held that this lividity is due to the cutting off of the arterial current and the oxygen which belongs to it by vascular spasm, and the destruction of corpuscles is due to the carbonic acid in the parts from which the oxygen is then shut off. If this view is correct, we have a result of suboxidation which deserves a prominent place in chemical pathology.

A disease that presents itself as of chemical origin is scurvy. The conditions that give rise to sea-scurvy are generally known. It is not probably as widely recognized that scorbutic affections are common on shore—among infants brought up by hand. It is to be attributed to the substitution for fresh milk of various artificial preparations. Not that these preparations are in themselves injurious, but they are insufficient.

Milk in its fresh state, and of good quality, whether from biped or quadruped, is antiscorbutic. What fresh milk contains that is so essential and so difficult to preserve, we do not know.

So many disorders have been shown to have foreign organisms associated with them, that we may be sure that before long many more will be in the same position. But if we find a microorganism for each disease, the question may still remain, What is the relationship between the two?

Outside the microorganisms is a pathological system which, though we recognize its existence and its importance, we understand but imperfectly. If the present rate of progress is maintained, we must be on the eve of discoveries in the physiology of disease which can scarcely fail to be of transcendent importance.

The study of the bacillus has given us antiseptic surgery; the study of its products may lead to we know not what in medicine, whether preventive or curative. Old truths grow and new ones gather around them. Jenner's vaccination may prove but the prelude to many similar modes of prevention. Immunity from anthrax and from hydrophobia can be brought about by the introduction of a harmless dose of a poison that in large quantity or a more active form is deadly. Why should not tuberculosis be prevented in a similar manner?

The influence of pathology, that is, of the habitual consideration of the nature and results of disease, has hitherto been to confer that most extensive of all knowledge—a knowledge of what we cannot do. A study of the results of disease and of its natural laws is a continual warning against the superficial fussiness of the shallow practitioner, who claps on here a poultice and there a blister, and somewhere else rubs in an embrocation assiduously, with a greater faith in the penetrating effects of such applications than knowledge of the profound nature of disease. Pathology teaches humility.

Such is the present position; but who can say what is before us? Pathological discoveries which revolutionize our knowledge of the nature of disease are not likely long to remain without practical results in the cure or prevention of it. In the conflict between man and the bacterium, between the highest of animals and the lowest of vegetables, it must be allowed that so far the vegetable has the best of it; but though the more vulnerable the animal is the more inventive, and it may happen in the future as it has in the past that science will prevail against numbers. Bacteriology is in its infancy, but it is gigantic, at least in possibility. To isolate the organic germs of tubercle, leprosy and other diseases which have similar pathological associations may be but the first step toward results which may prove to be of importance to humanity beyond all politics, beyond all conquest, beyond all the appliances which minister to ease, comfort and luxury.

Reference was made to what may be called the geography of pathology, the effects of climatic and other local influences in promoting and preventing morbid processes. Of local influences, though we know comparatively little, yet we know enough to suggest that of the means under our command of modifying chronic disease, change of place is the most important. To know that there is little stone in Ireland and much in Norfolk, little in the western counties, much in the eastern; that while in England it is most frequent in the colder parts, it is so prevalent in India that lithotomy has long been a native accomplishment; to discern the laws which underlie these facts, as we can partially do, cannot fail to throw light on the origin of the disease and help in its preventing.

The frequency and severity of diabetes in some parts of India and Ceylon cannot but suggest the influence of an opposite climate in its amelioration. If scorbutic affections are invited by cold, presumably by way of tissue waste and oxidations, what will be the result of the same agency upon the uric acid diathesis, gout and the disorders in which oxidation is wanting? It might be better to shudder in the frigid zone than to suffer arthritic tyranny in the temperate.

The infrequency of the granular kidney as originating in subtropical districts has already had its influence in

the treatment of the disease. Let us know what diseases are promoted and what are prohibited by the *genus loci*; let us take the great forces of external Nature into our confidence and we shall be able to control disease by greater agencies than the druggist can supply.

#### THE SECTION OF OPHTHALMOLOGY

was opened with an address by N. C. MACNAMARA, F.R.C.S.

The treatment of immature cataracts was first taken up. Immature cataracts are usually not operated on from a fear that a portion of the cortex of the lens will be left in the anterior chamber of the eye, and will probably excite inflammation of the iris, with its consequences. Inflammation of the iris, however, does not necessarily result from the presence of aseptic cortical matter in the anterior chamber after the operation of extraction. In every such proceeding, the eye should be kept absolutely free of septic matter, and by far the larger portion of the lens, even in immature cataracts, being removed, that which remains cannot well exercise injurious pressure upon the angle of the anterior chamber. The operation of extraction is successful in proportion to the completeness with which the lens and the capsule are removed.

If the conclusion is reached that there is no special reason why an immature cataract should not be extracted, the great advantage to be derived from such a proceeding, in cases of advancing cataracts in both eyes, is self-evident.

It is a mistake to condemn a patient suffering from cataracts in both eyes to wait for an operation until the cataract in one eye has become matured. The results following the extraction of immature cataracts are on the whole more favorable than those of fully formed cataracts, because in the former the lens escapes from the eye with less damage to surrounding structures than it does when a large, hard cataract has to be extracted, provided that a sufficiently large opening is made in the cornea to allow the lens to pass through it with ease, that an iridectomy is performed, and this best at the time of extraction. After rupturing the capsule of the lens, gentle and continued pressure with the curette must be made upon the lower portion of the cornea, the curette following up the lens as it passes outward through the section made in the cornea.

Among the upper classes, especially in those over sixty-five years of age, it is safer, having first applied a solution of cocaine to the eye, to get a thoroughly competent person to administer an anesthetic to the patient before operating. If an anesthetic is administered the eyelids should, after the operation, be smeared with an ointment of vaselin and iodoform, and a carefully adjusted pad of antiseptic wool applied over the eye with a linen bandage, to keep some pressure on the eye for twelve hours, or until all inclination to sickness has passed away, when a light cotton pad and elastic bandage should be substituted for the first dressings. Unless symptoms arise indicating the use of atropine, eserine, or cocaine, these drugs are never used after the operation for extraction. The patient can sit up on the third day after the operation, but the greater the care taken, for at least a fortnight, the better will be the result.

Based upon the conception of glaucoma as dependent upon either some mechanical obstruction to the escape



of fluid through the lymphatic system of the eye, or to an excessive secretion of lymph within the globe of the eye, a relation was traced between hypermetropia, hypertrophy of the ciliary muscle, with an augmented supply of blood, serous effusion, and pathological changes in the lymphatic apparatus of the eye.

Exceptionally glaucoma develops in patients with flat corneæ and shallow anterior chambers. Not only does the angle of the anterior chamber differ in form from that of the normal eye, but the hypermetropia is apt to lead to pathological changes in the tissues constituting the ciliary body, and so to impaired circulation of lymph in the eye, and to faulty innervation of the iris; the pupil, therefore, acts imperfectly, and remains somewhat dilated. Given these conditions, if from any exhausting cause the contractile fibers of the iris are still further relaxed, and the pupil becomes widely dilated, the iris shrinks upon its attachments, and so tends further to obstruct the already embarrassed lymphatic circulation through the ciliary body. In these circumstances an attack of acute glaucoma may occur at any moment, and be as quickly relieved by the application of eserine to the eye, which, as the pupil contracts, draws the iris from the angle of the anterior chamber, and so frees the spaces of Fontana and the passage of lymph from the eye.

The glaucomatous symptoms may be prevented by making the patient *constantly* wear proper glasses, and applying eserine to the eye once or twice a week if the pupil is inclined to remain dilated or the patient has a tendency to increased intraocular tension. The object is to give the ciliary muscle rest, and to keep the pupil contracted.

Four cases of double optic neuritis, developed in the course of influenza, were reported.

In one the appearances were those of intense papillitis, with numerous hemorrhages into the retina, and consecutive atrophy, with blindness. The other three were instances of uncomplicated papillitis with great impairment of vision; the discs in all three gradually cleared, and the patients regained perfect vision.

#### THE SECTION FOR DISEASES OF CHILDREN

was opened with an address by JAMES GOODHART, M.D., F.R.C.P.

He objected to the word *pediatrics*, insisting that the members of the Section were not specialists. He deplored the relegation of a study of constitution and predisposition to a place secondary to microbic influence. He characterized as the specialism of specialism the tendency that sends a woman to a gynecologist for one condition; to an obstetrician for another; to a medical man for a third; that takes her to one specialist for her baby, and to another for an older child.

The child is father to the man. The diseases of children are as the early eruption upon the skin is to the mature affection, and they must be studied, not only as they are seen, but in the light of what they will become; they are an embryonic stage; but they *are* the mature disease modified only by the physiological conditions and activities existing at the time. Disease as it manifests itself at one time and at another does but complete the picture of the one disease, and some are children in some respects to old age, while others, though being yet young, have known no childhood.

Though not recognized as one of the diseases of childhood, gout does occasionally appear in that period, and is not to be discriminated from acute rheumatism; it attacks the larger joints; is attended with free sweating; it certainly attacks the heart, and is also relieved by the salicylates. It may be said, of course, that this is all acute rheumatism. So be it. But if so, we must say that, under some circumstances or at one period of its life, gout is acute rheumatism—a very important fact in the history of the two diseases, if it be true.

It was brought out that excessive excretion of uric acid in the urine was in children, as well as in adults, dependent not only upon a diet rich in meat but also upon a diet largely farinaceous. Renal colic is far-commoner in children than is usually supposed, but it passes for stomach-ache pure and simple, and goes unrecognized.

Some children habitually pass a urine of abnormal concentration, in which albumin may occasionally appear; it seems worth consideration whether such a condition may not foreshadow a risk of the supervention of granular kidney.

The shape of the head in children, suggests the future of the man, and tells of the functions of the brain itself. Observation has demonstrated that the frontal lobes of the brain may suffer serious injury with disproportionately insignificant sequelæ in children, as well as in adults. It appears that, a head with an ill-developed and small frontal segment is indicative of the existence of a brain that will, if sought for, give evidence of some want of balance or control. Such a brain is likely to take on the epileptic habit; it is a brain that slight provocatives stir to frenzy; it is likely to be cunning; it is likely, as time goes on, to exhibit one or the other of the common vices of nervous action—to be intensely self-conscious, or painful; to be impulsively incoherent in its action; to be mad; or worse, criminal. It seems as if the whole order of being is enwrapped in the frontal lobes.

In such children the nervous capital is small; they consequently need to have chosen for them the best investments.

Some children display a special tendency to boils; while erysipelas in childhood presents a contrast with its occurrence later in life, being, in the one, uncommon, prone to be migratory, of indefinite duration and almost invariably fatal; in the other, frequent and transitory. Epistaxis is peculiar to childhood; so is a curious condition of the pupil that is sometimes widely dilated and temporarily insensitive to even the strongest light, but the light removed, the iris immediately acts.

Intussusception is an ailment allied to this in the sense that it is a disorder of an involuntary muscle which may not be the mere accident it is often supposed to be.

Again, what does that common condition, the frequent passage of pale feces mean? Clothed in the garb of the veriest commonplace it is a most important matter, for there are few greater sources of anxiety. A symptom of this kind may mean anything—a disproportionate quantity of milk food, for instance—and unquestionably, in some cases, such as cholera infantum, it is due to suppression of bile.

The interest of these cases lies in what they foretell for the man and woman of the future, for such children, unless wisely treated, develop into the dyspeptic, the morbidly sensitive, the depressed, the neuralgic, the physic-swallower, the patent medicine machine, in short,

the ignoble army of the self-martyred, who think they are liverish and are not; who can tell every detail of the daily variation of their uncomely functions, but of weightier matters, such as the happiness they get out of life, the happiness they impart to life, their objective relations to the world in which they were born to take a part, they have nothing to say or to think.

There is, however, another disease that is considerably illuminated by attempting to trace it back from adult age to childhood—spasmodic asthma. Asthma is never seen as such in babies. If it does not occur as *asthma* it has a representative in an exceedingly common ailment. From babyhood upwards, but less commonly as the child grows older, to be about seven or eight years old—about the age when spasmodic asthma begins to appear, although it cannot be said to be common even at so early an age as that—certain children and certain families are prone to sudden attacks of what is apparently acute pulmonary catarrh. Some of these cases are supposed to be due to chill. The child is therefore watched with the most vigilant care; it is packed in many additional layers of clothing; it is swathed in shawls and neck apparel; it is closely shielded from every breath of air. For a bath a lick and a promise suffice, but the child still catches cold with ever-increasing readiness. It may be thought that the pulmonary disturbance is all due to the *stomach*, and there is less difficulty in establishing a more reasonable probability of an origin of this kind. The child is dieted with the most scrupulous care, and yet the attacks recur. They may be a little milder or less frequent, but the improvement is slight. It is certain that this class of cases is not in the main due either to chills or to indigestion, although, no doubt, these children have unusually sensitive stomachs, and good wholesome food sometimes makes a disturbance in them that would have no effect in those of more healthy parentage.

These cases are of the nature of paroxysmal neuroses, and they are the asthma of babyhood, and they are not to be treated, any more than asthma is, by shielding the sensitive periphery from all stimuli, because now and then such and such things seem to excite an attack—assuming that the healthy infant is exposed only to normal influences. Asthma was never cured by coddling, nor are these attacks. They may be much relieved by a wholesome routine, and by remedies directed to reducing the irritability of the nervous centers.

In addition to the connection between rheumatism and gout, in childhood, it is possible that the so-called essential paralysis of childhood also bears some relation to rheumatism.

Mitral stenosis is said to be congenital and acquired; but a specimen of mitral stenosis in an infant has not been seen; mitral stenosis does not occur in babies. The origin of mitral stenosis is to be sought in the mitral incompetence that is the common, the only form of mitral disease in early infant life. Mitral stenosis does not occur as a malformation, and it cannot occur as the result of inflammatory processes, for the few months of intra-uterine life are not long enough to allow of its production under those conditions of the circulation in the teeth of which it is produced.

Those who devote themselves to the study of the diseases of children will make themselves most useful

to mankind, and make their study more interesting and instructive to themselves if they come to their work not as specialists, who are men of single eye, but as those who are accustomed to look all round a case before going special; for, if we except the particular cunning of the hand in the manipulative treatment and management of disease, there is no organ with which, at any rate, physicians are concerned that is not constitutional. There is no part, for instance, more constitutional than the eye, none more so than the nose, none more so than the larynx, none more so than the big toe. It is not enough to know that there is a bacillus tuberculosis, and that its presence works certain destructive processes in our tissues. We want also to know why it affects some people, some families, and not others; and it is conceivable at any rate that the cure or prevention of the ill-effects may, after all, come by understanding or unravelling the meaning of individual proclivity, and not by destroying or starving the invading germ; and this is never more true or more obvious than in children. In the diseases of children there is nothing that gives the smallest countenance to specialism—they are rather to be considered as the grammar of disease.

### THIRD DAY—JULY 30TH.

JOHN CHIENE, M.D., F.R.C.S. Edin., F.R.S., delivered  
THE ADDRESS IN SURGERY.

For his subject he took John Hilton, and for his principle, *rest as a therapeutic agent in the cure of surgical ailments*.

Rest has been divided into mechanical and physiological, but this division is a purely arbitrary one. It has, however, a mental and a bodily aspect—a psychical and a physical side.

We all know it is not work but worry—mental unrest—which kills; a person will bear much physical discomfort in order that he may be relieved of the mental discomfort of his condition. In recommending any special treatment one should take into consideration the effect that the decision will have on the mind of the patient. We all know how frequently operations for carcinoma are unsatisfactory, but we hardly estimate the great mental depression that often follows refusal to attempt to give relief, more especially after the recurrence of the disease—after the primary operation has taken place. An attempt—even if unsuccessful—to remove a tumor will often give the patient a feeling of mental rest in the very thought that no stone has been left unturned in the endeavor to give relief. There is a class of cases that may be termed the “phobias”—syphilophobia, cancerophobia—in which the whole disease is psychic; in no condition is there more pleasure in giving relief, because the condition is a most unhappy one. There is one aspect of the mental side of disease which has not received the attention it deserves. When a patient is confined to bed, away from work, he often suffers as much from the worry of mental inactivity as from the physical disease for which he is under treatment. The prescription “don’t worry” might with advantage be burnt; “do some work” should take its place.

This is an age of diagnostic incisions on the part of surgeons, and faith on the part of patients, that after the incision has been made, and the part thoroughly ex-



amed, the surgeon will have more light, and be best able to judge as to what should be done.

In diagnostic incisions we have a valuable aid in avoiding psychical unrest. These diagnostic incisions are the direct outcome of the minimized danger of such incisions. A new diagnostic power has been placed in our hands. The first step in the operation is the diagnosis, and the surgeon has no hesitation in taking this step. He requires from his patient a free hand; he takes less on faith and more on sight.

Dr. Chiene held that chloroform is the best anesthetic. Cocaine as a local anesthetic is of great value in adults. Care must be taken to use a pure solution, and to see that the injection is not made directly into a vein. The use of local anesthetics, such as cocaine, ether, or chloride of ethyl, may be overdone. The work of the surgeon may require to be done in too hurried a manner, not altogether satisfactory either to the patient or to the surgeon. Mental unrest, arising from a feeling of work imperfectly done, worries the surgeon; and in any operation requiring time chloroform is to be preferred to the local anesthetic.

Pain given to a patient, whether in the dressing of a wound or in the examination necessary to make a diagnosis, is a most fruitful source of unrest. Confidence is lost between patient and surgeon; this is more especially true in children. Healthy wounds are not painful; the healing of a wound is a physiological process closely allied to—in fact, it is—growth. Inflammation in wounds can be avoided, and, if avoided, then pain as a cause of unrest is unknown.

One of the most frequent causes of local unrest in wounds and the free serous oozing that accompanies it is the use of unnecessarily strong antiseptics. The use of weaker solutions is gradually replacing the use of the stronger. Asepticism is taking the place of antisepticism. The main danger of contamination is from what is introduced into a wound.

Another aspect of Hiltonism is the use of absorbable drains, so that dressing of the wound is not required in order to remove the drain. Pressure and careful apposition of the edges and surfaces, combined with the absence of any irritating antiseptics, have, to a great extent, done away with drainage of any sort. The safer plan is to provide drainage for twenty-four hours, during the time when reactionary hemorrhage is likely to happen. If India-rubber tubing is used it can be arranged so that it can be removed without disturbance or exposure of the wound. Free evaporation through the dressing is all-important. In psoas abscess free drainage, and its accompaniment, rest, is best attained by a posterior opening at the lowest point of the abscess cavity (the patient recumbent), in the angle between the outer edge of the erector spinæ and the crest of the ilium. So also in retro-pharyngeal abscess; an opening posteriorly to the sterno-mastoid muscle acts in the same way. In both of these forms of abscess the aseptic management of the case is more easily carried out than when the opening is anterior.

Leaden splints should be used to steady limbs after amputation and excision. The splint should be so shaped that it can be unfolded without moving the limb. After excision of the mamma the arm should be anchored by the side with a leaden splint. Pressure should be applied firmly; the distal portion of the limb should

be left exposed, so that, if it swells the bandage must be loosened. Pressure is properly applied to any part if it fulfils two conditions, painlessness and non-interference with the blood-current through the part.

Horsehair stitches are valuable, combining rigidity and elasticity—rigidity acting as a splint steadying the edges, elasticity enabling them when cut to be removed without pain. When the stitches are cut, the knot should be grasped and traction made toward the side on which the loop has been cut.

A plaster applied over a boil in its early stages acts as a splint, steadies the part and relieves the pain. The boil is frequently aborted by this simple means.

The value of extension in the treatment of fractures of the lower extremity is universally acknowledged; we have only to take care that it is not overdone. In fractures, injuries, and diseases of the spine, in sacro-iliac disease, and in fractures of the pelvis, the use of double extension is also of undoubted value. Treves has demonstrated the value of rest in enlargement of the lymphatic glands in the neck.

In all cases in which complete rest of the trunk is called for, use a thick and firm mattress made in three pieces, the central portion of which can be withdrawn for the performance of the acts of defecation in both sexes, and the act of urination in the female. In the diagnosis of injuries in the region of the hip, observe the parallelism or want of parallelism between two tapes, one passing through the anterior superior spinous processes and the other through the tips of the great trochanters of the femur.

Dr. Milne Murray has offered an explanation of the action of hot water on the arrest of hemorrhage that well illustrates rest. In epistaxis prevent the air passing through the nasal cavity by tightly grasping the nose, and the epistaxis will frequently cease, the part being kept at rest.

In cranial surgery, we have in the curved incision, as suggested by Mr. Victor Horsley, a means of restoring a flap to cover and give support to the denuded brain-tissue or dura mater. In intracranial hemorrhage, intradural and extradural, we now feel justified in cutting down and arresting the hemorrhage by ligature, or by the hot douche. In apoplexy, an opening into the cranial and dural box is a justifiable surgical procedure, giving rest by relieving tension.

In spasmodic wryneck the patient is in constant unrest. Relief is given by excision of a portion of the spinal accessory nerve.

In rectal surgery gradual dilatation of the sphincter ani before operation gives rest after the operation, as it is followed by a temporary paresis. In colotomy the inguinal region is preferable to the lumbar, because mental worry is avoided by making an artificial anus in a situation which the patient himself has under command. In lumbar colotomy the cul-de-sac between the rectal stricture and the opening in the colon fills with feces and causes unrest. In inguinal colotomy, if the opening is intended to be a permanent one, the whole lumen of the sigmoid flexure should be brought out as a loop through the wound in the wall, and fixed there with long pins passed through the abdominal wall and mesocolon, and again through the abdominal wall, bringing the parietal peritoneum in contact with the visceral peritoneum. Stitches are a source of unrest;

simple apposition is all that is necessary to obtain firm union.

In the ligation of internal piles, the division of the mucous membrane at the anus with scissors before transfixion and ligation, and tying the ligature tightly, so as to completely strangulate the pile, are both means that diminish pain after the operation. The pile-mass dies without any inflammation; it dies of dry, painless gangrene. In cases in which the whole circumference of the gut is affected, excision is the most thorough and satisfactory mode of treatment.

There is no organ in which the value of rest is better illustrated than in the bladder. In disease its systole and diastole can be checked in different ways, and the cystitis caused by the unrest, as evidenced by frequency of micturition, is relieved. This can be done by fixing a gum elastic catheter in the bladder, taking care that the eye of the instrument is just within the cavity, and attaching to the catheter an India-rubber tube that passes into a vessel at the side of the bed. If the tube passes under water below the level of the bladder, and the instrument and tube are full of fluid, there will be, by the siphon-action of the arrangement, a head of water which, by its suction, will remove the water from the bladder as it passes from the ureters. A foot of fall is generally sufficient to keep the bladder empty. If the fall is greater, then the mucous membrane is apt to be sucked into the eye of the instrument, and a block takes place, the bladder filling with urine. When this happens pain will at once be felt by the patient; in fact, his sensations are the best guide to the height at which the vessel at the side of the bed should be placed. By this simple means we can give the bladder rest. In external division of stricture of the urethra the same means can be used to keep the wound absolutely dry and facilitate healing. We can also rest the bladder by perineal or by suprapubic cystotomy. In either case the bladder collapses and the viscus gets rest. In intractable cases of cystitis in the female the suprapubic operation deserves further trial. The unrest after lithotomy is due to fragments of stone left in the bladder after crushing; it is important to crush and entirely remove all the fragments at one operation.

In hemorrhage from the bladder or prostate a suprapubic opening arrests the hemorrhage, the cause of which is the contraction of the bladder, which at once ceases when the bladder is opened. The hemorrhage during the operation may be checked by the use of the hot douche.

In vesical hemorrhage, the mere washing out of the bladder with hot boracic lotion often checks the bleeding; in fact, hemorrhage from any cavity is most easily and satisfactorily checked by the hot douche.

In tracheotomy, Hilton points out the value of rest to the inflamed larynx. One of the main objects of the surgeon is to prevent blood getting into the trachea, and to the lungs, where it is the most fertile source of unrest, setting up pneumonia, the common cause of death after tracheotomy, when death is not due to the disease for which the operation was performed.

In the treatment of cut throat, if we perform tracheotomy at once, and accurately unite the wounded surfaces, we attain more rapid healing, because the wound is not used as a funnel through which the air is admitted to the lungs. Movement of the parts is reduced to a

minimum, the part in fact is kept in a state of rest encouraging and facilitating healing.

In the application of a bandage to varicose veins, let us see that it is applied before the patient gets out of bed, and taken off after he is in bed; so also in the application of a truss in hernia the same rule must be constantly followed. Allow the veins to fill, or the hernia to come down once in twelve hours, and the bandage or truss ceases to act as a curative, and only acts as a palliative agent. We allow, by the vein filling or the hernia coming down, a temporary unrest which does away with the good of the previous twelve hours' support of the retentive apparatus. It is well to note that continuous gentle elastic pressure will often act most efficiently, painlessly, and restfully in reducing an irreducible hernia, a prolapse of the rectum or a paraphimosis.

There is another side to this picture, or perhaps it may be the same picture looked at from a different standpoint. Much harm may be done by excessive attention to rest. Evil may result from too prolonged rest. Mechanical rest may, in one sense, be antagonistic to physiological rest. Mechanical rest, in many cases, must be interfered with in order to attain physiological rest. It is here that massage is so valuable.

In breaking down adhesions in old standing cases of fracture, sprain, or strain, one must act in a decided manner. Their presence is associated with limited movement, pain on movement, or pain on pressure, and the use of firmly applied rotatory massage, or the sudden stretching of the tissues that are matted together, often gives immediate and lasting relief.

In the case of nerve-stretching in sciatica, the cases that are benefited are, in my opinion, those that may be called trade sciaticas, due to some special position adopted in the special trade pressing on and irritating the sciatic nerve. The pain is relieved by breaking down the fibrous adhesions in the nerve-sheath and also among the nerve-fibrils. The operation is sometimes a source of physical unrest to the operating surgeon if he does not easily find the nerve; this unrest is avoided if, in operating, the patient lying on his face, the surgeon will stand on the opposite side of the limb to be operated upon. If he then makes an incision over the nerve at the lower border of the gluteus maximus large enough to enable him to introduce his forefinger, with which, using it as a hook, he draws the middle line of the patient, he will at once find the nerve lying externally to the muscles arising from the tuber ischii.

#### FOURTH DAY—JULY 31ST.

EDWARD SEATON, M.D., F.R.C.P., delivered the "ADDRESS IN PUBLIC MEDICINE." He devoted himself to a consideration of "The Evolution of Local Sanitary Administration."

### NEWS ITEMS.

*Conviction of a Medical Practitioner for Malpractice.*—On Saturday, July 4th, Caleb Charles Whitefoord, M.R.C.S. Eng. and L.S.A. London, was convicted at the Central Criminal Court, London, on a charge of procuring abortion, and sentenced to five years' penal servitude. The evidence made it abundantly clear that his conviction was just.



**Medical Students at German Universities.—**

	Winter, 1890-91.			Summer, 1891.		
	Germaus.	Foreigners.	Total.	Germaus.	Foreigners.	Total.
Berlin . . . . .	1014	383	1397	951	306	1257
Bonn . . . . .	270	11	281	304	19	323
Breslau . . . . .	297	6	303	339	5	344
Erlangen . . . . .	147	242	389	135	211	346
Freiburg . . . . .	93	218	311	79	288	367
Giessen . . . . .	85	73	158	88	74	162
Göttingen . . . . .	164	50	214	173	46	219
Greifswald . . . . .	341	30	371	360	30	390
Halle . . . . .	227	42	269	224	46	270
Heidelberg . . . . .	100	199	299	79	239	318
Jena . . . . .	66	148	214	53	161	214
Kiel . . . . .	171	66	237	225	94	319
Königsberg . . . . .	222	13	235	250	11	261
Leipzig . . . . .	415	498	913	389	457	846
Marburg . . . . .	201	41	242	231	45	276
München . . . . .	489	568	1057	469	664	1133
Rostock . . . . .	56	80	136	47	81	128
Strassburg . . . . .	121	208	329	110	227	337
Tübingen . . . . .	122	114	236	109	156	265
Würzburg . . . . .	169	738	907	142	652	794
Total . . . . .	4770	3728	8498	4757	3812	8569

—*Fortschritte der Medicin*, July 15, 1891.

**A Five Years' Medical Course.**—The Medical Council of the College of Physicians and Surgeons of Ontario recently passed the following resolution: "On and after July 1, 1892, every student must spend a period of five years in actual professional studies, except as hereinafter provided, and the prescribed period of studies shall include four winter sessions of six months each and one summer session of ten weeks; the fifth year shall be devoted to clinical work, six months of which may be spent with a registered practitioner in Ontario and six months at one or more public hospitals, dispensaries or laboratories—Canadian, British or foreign—attended after being registered as a medical student in the register of the College of Physicians and Surgeons of Ontario; but any change in the curriculum of studies fixed by the Council shall not come into effect until one year after such change is made."

**Medico-Chirurgical College.**—The following changes have been made in the faculty: Dr. G. E. Stubbs, Emeritus Professor of Clinical Surgery; Dr. W. S. Stewart, Emeritus Professor of Obstetrics and Clinical Diseases of Women; Dr. H. E. Goodman, Honorary Professor of Surgery, Clinical Surgery and Orthopedics; Dr. J. H. Anders, Professor of the Principles and Practice of Medicine, Clinical Medicine and Hygiene; Dr. E. E. Montgomery, Professor of Obstetrics and Gynecology; Dr. Ernest Laplace, Professor of Surgery, Pathology and Clinical Surgery; Dr. W. F. Waugh, Professor of Clinical Medicine.

**American Dermatological Association.**—In addition to the papers announced to be read at the meeting of the American Dermatological Association, the following will be presented:

The Hypodermatic Use of Hydrargyrum Formamidatum in Syphilis, by Dr. R. B. Morison.

Retarded Hereditary Syphilis, by Dr. R. B. Morison.

Epilation: its Range of Usefulness as a Dermatotherapeutic Measure, by Dr. J. Zeisler.

**Hygienic Exhibition at Vienna.**—An international exhibition of food supply and domestic hygiene will be held at Vienna from September 1 to December 1, 1891. The organizing committee includes the names of Professors Ludwig, Vogel, Max Gruber, F. von Gruber, Kratschmer and Rösler, besides Drs. Hamelkoos, of Amsterdam, Reichardt, of Jena, Monin, of Paris, and Bein, of Berlin.—*British Medical Journal*, July 18, 1891.

**Women Physicians.**—Madame Cocepcon Aleixandre has been appointed physician in the "Hospital de la Princesa." It is stated that she is the first woman in Spain to occupy an official position. A Mohammedan girl, Razie-Koutlairoft-Hassum, recently passed, with distinction, the medical examinations at Odessa.—*Int. klin. Rundsch.*, 28, 1891.

**The Hygiene of Infants.**—A prize of one thousand francs (\$200) is offered by the French Academy of Medicine for the best essay on the Prophylaxis of Syphilis during Lactation. Theses in competition must be in the hands of the Academy before the 1st of March, 1892.

**Hospital for Women in Bosnia.**—It is announced that a hospital for female patients will shortly be erected in Bosnia, all the medical officers of which will be women.

**Dr. George E. de Schweinitz** has been elected to fill a third chair of Diseases of the Eye created by the trustees of the Polyclinic.

**Italian Pharmacopœia.**—The new Italian Pharmacopœia is now ready. It has been three years in preparation.

**Dr. F. Fuhr** has been elected professor extraordinary of surgery at the University of Greifswald.

**OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM JULY 28 TO AUGUST 3, 1891.**

MUNN, CURTIS E., *Surgeon*.—Is granted leave of absence for twenty days, to commence on or about August 5, 1891.

POWELL, JUNIUS L., *Assistant Surgeon*.—Granted leave of absence for two months, on surgeon's certificate of disability, with authority for his admission to the Army and Navy General Hospital, Hot Springs, Ark.

COMMUNICATIONS are invited from all parts of the world. Original articles contributed exclusively to THE MEDICAL NEWS will upon publication be liberally paid for, or 250 reprints will be furnished instead of payment, provided that the request for reprints be noted by the author at the top of the manuscript. When necessary to elucidate the text, illustrations will be provided without cost to the author.

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